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J. Hufford

J. Lee

K. Dombkowski

C. Roehrig

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DEVELOPMENT OF COST MODELS TO SUPPORT DIAGNOSIS RELATED MANAGEMENT

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VECTOR RESEARCH, INCORPORATED

P.O. Box 1506

Ann Arbor, Michigan 48106

(313) 973-9210

901 S. Highland Street
Arlington, Virginia 22204

2511 Garden Road
Monterey, California 93940

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FOREWORD

This document presents the development of cost models which support the OASD(HA) resource allocation and the Coordinated Care Program (CCP) efforts. The document provides an in-depth discussion of a methodology that projects the Operations and Maintenance component of MTF expenses based upon MEPRS cost models. The methodology focuses on program elements 0807711 (Regional Defense Facilities) and 0807792 (Station Hospitals and Clinics). The various model forms considered in the development process are presented and discussed, and the models ultimately selected identified. In addition, comparisons of predicted and observed costs based upon the selected models for FY88 and FY89 are presented. This document was prepared under contract MDA903-88-C-0147. Questions or comments regarding this document should be directed to LTC Stuart Baker, OASD(HA) Resource Analysis and Management Systems, (703) 756-1918.

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EXECUTIVE SUMMARY

A methodology has been developed which provides estimates of Operations and Maintenance resource requirements in support of the DoD healthcare budget review process. The methodology projects O&M resource requirements for program elements 0807711 and 0807722 based upon expected workload at each MTF and freestanding clinic. Workloads are case-mix adjusted and expressed in terms of Inpatient Work Units (IWUs) and Ambulatory Work Units (AWUs). Service requirements are subsequently derived from aggregates of MTF estimates. The methodology is based upon data from three sources:

- Medical Expense and Performance Reporting System (MEPRS);
- Service biometrics departments; and
- Service financial departments.

The methodology is built upon cost models which relate case-mix adjusted workloads from the Services' biometrics departments and MEPRS with MEPRS expenses. This approach addresses several issues:

- Inpatient biometrics data allow the assignment of DRGs and MEPRS provides the basis for AWUs to reflect case-mix complexity.
- MEPRS data identify inpatient non-clinician expenses that are analogous to Medicare Part A and CHAMPUS Hospital Services expenses.
- Service financial data provide historical requirements by MTF, program element code (PEC), object class, and workcenter.
- MEPRS data are standardized across the Services.

These attributes make the resultant cost models particularly useful because it permits DRGs to be used in a fashion that is consistent with their use under Medicare and CHAMPUS. Further, the models project O&M requirements which reflect historical Service branch and MTF staffing mix.

Exhibit ES-1 provides a schematic diagram which summarizes the resource allocation methodology. The exhibit illustrates that the methodology has four main components:

- (1) Project expected inpatient and ambulatory workloads in terms of IWUs and AWUs.
- (2) Estimate MEPRS inpatient and ambulatory expense based upon each MTF's projected workloads.
- (3) Estimate 0807711 and 0807792 O&M requirements based upon projected MEPRS expenses for each MTF and the historical relationship between O&M resources and MEPRS expenses.
- (4) Review Service and MTF level projections with respect to unique requirements or changes in mission which impact expected O&M requirements.

Each of these steps is considered in additional detail in the paragraphs which follow.

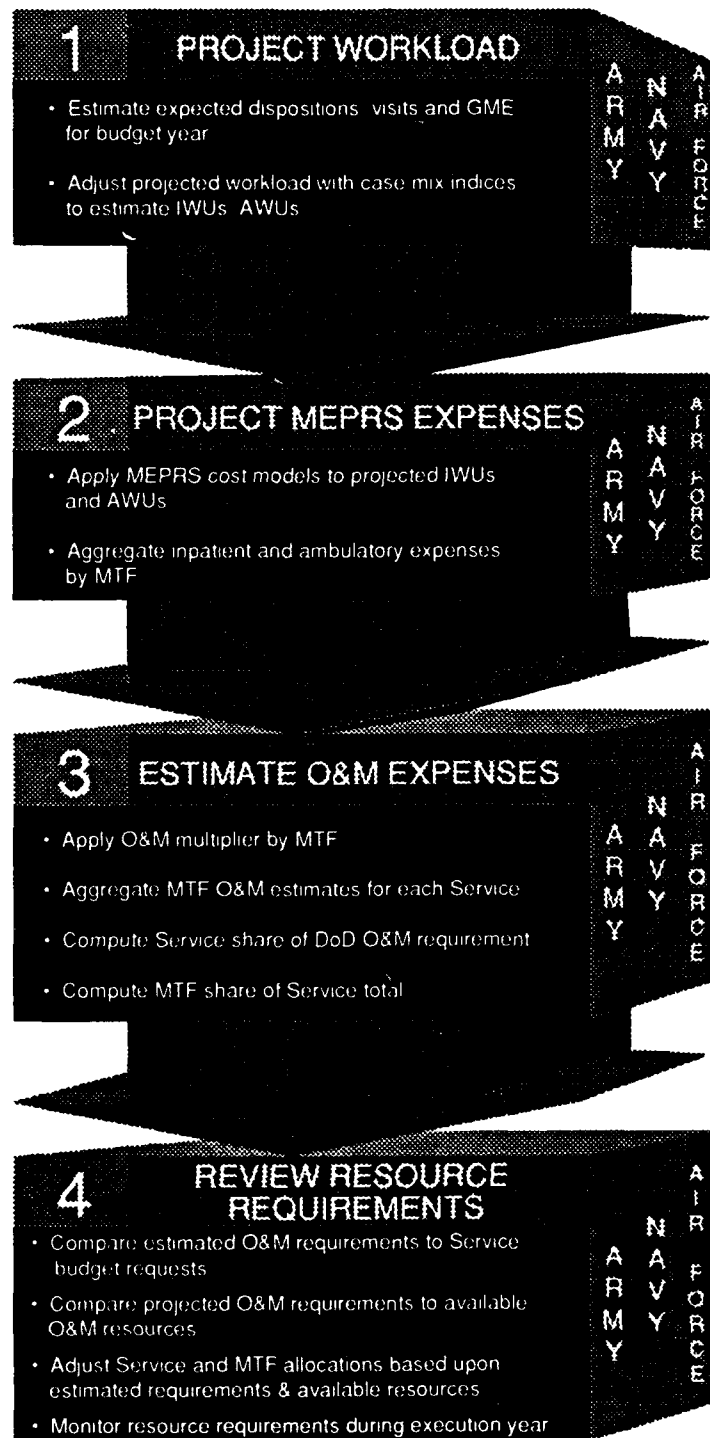
Project IWUs and AWUs

Workloads for the prospective budget year under review are projected in terms of IWUs and AWUs. This can be accomplished by using historical inpatient Relative Case-Mix Index and AWU-to-visit ratios observed at each MTF during the most recent year data are available applied to disposition and visit projections. Modifications may be made to reflect known changes, such as planned expanded services or closed clinical services.

Estimate MEPRS Inpatient and Ambulatory Expenses

MEPRS cost models were developed which project total expenses as a function of case-mix adjusted workloads. For inpatient care, workload is expressed in terms of IWUs while ambulatory workload is tracked in terms of AWUs. Cost models were developed which project inpatient non-clinician, inpatient clinician, and ambulatory expenses as a function of the respective workload measure. The cost models are sensitive to

EXHIBIT ES-1: RESOURCE ALLOCATION METHODOLOGY SUMMARY SCHEMATIC



facility type (medical center, CONUS community hospitals and overseas hospitals) and Service branch. Graduate medical education (GME) is factored into the medical center cost models. MEPRS cost and workload data have been selected to serve as the basis for the total cost models presented in chapters 2 through 4, given the standardization built into MEPRS and the fact that these data are readily available. As a result, Service branch-specific total cost models based upon MEPRS are well suited to DoD resource allocation applications since model outputs have minimal bias associated with Service-unique reporting differences. In addition, MEPRS data provide sufficient levels of detail to produce total cost models which project expenses that are analogous to Medicare Part A and CHAMPUS Hospital Services expenses. Thus, the models provide the basis for make versus buy decisions at the catchment area level. Chapters 2, 3 and 4 of this document present the details regarding MEPRS cost model development as well as the final models.

Estimate 0807711 and 0807792 O&M Requirements

Finally, projected MEPRS total expenses based upon these models are converted into terms that are comparable with the requirements tracked in the Services' and DoD's budget planning processes. The conversion from MEPRS to budget dollars is made through the use of MTF-level adjustment factors. These factors are multiplied by the projected MEPRS expense to derive estimated O&M dollars, and thus are referred to as "O&M multipliers". Each MTF's multiplier is based upon the historical relationship between expenses reported through the MEPRS system and those reported through financial/budgeting channels. The O&M multipliers have been developed at the MTF level in order to ensure that projected requirements are reflective of individual MTF resource utilization/requirements. The multipliers described in this document address

the estimation of O&M expenses, specifically those expenses found in two program elements:

- 0807711 - Care in Regional Defense Facilities; and
- 0807792 - Station Hospitals and Clinics.

As noted above, the multipliers focus on O&M, given the role OASD(HA) has traditionally played in the budget review process.

The initial focus of O&M estimation for these two program elements is based upon two facts. First, PECs 0807711 and 0807792 address nearly 60 percent of direct care O&M expenses and thus the multiplier projects a significant portion of O&M requirements. In addition, these two program elements are arguably the portion of O&M which is most closely linked to inpatient and ambulatory direct care. As noted in section 6.3, the O&M multiplier presented here may be enhanced to address other PECs within O&M or be expanded to include military personnel if policy dictates these changes.

Review of Projections and Budget Execution Year Monitoring

The 0807711 and 0807792 O&M resource requirements projected by the methodology provides an objective basis for the development and review of each Service's aggregate budget request. It is anticipated that the projected 0807711/0807792 O&M requirements for each MTF be reviewed by the Services to ensure that the estimates properly account for MTF-unique missions or special circumstances which would impact O&M requirements. Review of historical O&M requirements for each MTF provides a management tool to assist in the identification of facilities with unexpected resource requirement levels. MTFs which deviate from historical O&M requirements with no apparent programmatic explanation warrant further review to determine whether or not workload and financial data input into the methodology are accurate. If no data quality problems

are evident, the deviation between projected and historical O&M resource requirements must be reconciled through management actions by the respective Services.

Future Analyses

The methodology presented in this document focuses on the projection of 0807711 and 0807792 O&M resources based upon projected inpatient and ambulatory MEPRS expenses. It is recognized that this methodology would benefit from improvements in several areas:

- expansion of the methodology to address additional program elements within O&M;
- expansion of the MEPRS cost model methodology to address other areas of MTF expense, including expenses tracked under the MEPRS dental and special programs functional areas;
- improve the sensitivity of the model to changes in military personnel availability which trigger changes in O&M requirements; and
- provide consistency with the OASD(HA) Health Budgets and Programs Report on the Cost of Medical Activities (COMA) by converting projected expenses into projected obligations.

It is anticipated that tasking which support these enhancements will be sponsored by OASD(HA) during the upcoming year. Further, regular Workgroup meetings will be convened by OASD(HA) to promote the integration of Service feedback into the methodology refinement process.

1.0 INTRODUCTION

This report documents the development of a DRG-based method for estimating the cost of providing care at Department of Defense (DoD) military medical treatment facilities (MTFs). The estimation employed regression analysis in determining the historical relationships among observed MTF expense, workload, and facility characteristics. It is a matter of policy to determine whether, and to what extent, these patterns should continue, as well as what other incentives should be implemented in the final allocation models. The data used as the basis for the analysis were FY88 Biometrics and Medical Expense and Performance Reporting System (MEPRS) data.

This report contains six chapters. Chapters 2.0 through 4.0 discuss the modeling efforts for inpatient nonclinician expenses, clinician salaries, and ambulatory expenses, including the models considered, regression estimation results for these models, and the models chosen for application and further analysis. Chapter 5.0 presents the results of applying chosen models to historical workload data and an analysis of the impact of these models upon DoD facilities. Chapter 6.0 provides a methodology for implementing these models to project operation and maintenance (O&M) expenses. The remainder of this introduction presents a brief orientation to the modeling approach used.

1.1 PREVIOUS MODELING EFFORTS

Much of the foundation for the work described in this report was laid in constructing nonpersonnel resource allocation models.¹ The initial modeling efforts included intensive research of the military

¹Described in **Development of Resource Allocation Models for DoD Medical Treatment Facilities**, VRI-HMS-1 WP90-6, 20 July 1990.

Services' financial data systems, focusing on the allocation of nonpersonnel dollars which represent a limited portion of the total O&M budget. Subsequent OASD(HA) guidance required that comparability be achieved with other health care systems using DRGs for reimbursement. Specifically, both the CHAMPUS and Medicare programs use DRGs to reimburse for hospital services, while inpatient physician services and outpatient services are handled separately.

As a result of the new OASD(HA) guidance, the basis of the modeling efforts shifted to the use of MEPRS data, which allowed the separate identification of inpatient nonclinician, inpatient clinician, and ambulatory expenses in a uniform manner among the three military Services. Particular emphasis was placed on the development of inpatient costs, based upon DRGs, comparable between the direct care and CHAMPUS systems. It is anticipated that the development of direct care and CHAMPUS comparable costs will provide the basis for "make versus buy" decisions at the catchment area level. Further, these models provide the basis for allocating resources to each of the Services and for monitoring resource consumption relative to allocation guidelines.

The final models were documented in the report, **Optional Task Final Report** (VRI-HMS-1 FR91-1, 28 February 1991). That report briefly discussed the methodology for computing workload, expenses, and graduate medical education (GME) program intensity, presented the final model parameters selected, and discussed the impact of applying the models. It also presented a series of comparative tables illustrating direct care and CHAMPUS costs for each catchment area. Finally, it provided a discussion of alternative approaches to allocating a joint direct care and CHAMPUS budget. The next section provides a brief overview of the modeling methodology.

1.2 OVERVIEW OF APPROACH

A key initial decision in the modeling process was to model medical centers, CONUS community hospitals, overseas facilities, and clinics separately. There was no reason to assume that these facility types behaved identically, and this decision allowed the estimates of the model parameters to vary from facility type to facility type. This approach necessarily resulted in negligible shifting of resources across these four groups of facilities. Another principle adopted to guide model development was to keep the models as understandable as possible, without sacrificing substance.

As will be seen in the following chapters, simple, straightforward models were often chosen over more sophisticated ones in selecting the final models that were published in the **Optional Task Final Report**. Emphasis was placed on model forms which were intuitively appealing. This was done, in some cases, even where the more sophisticated models explained more of the variation in expenses among facilities, or where certain variables were statistically significant in explaining the differences in expenses among the facilities. Additional input and feedback are required from DoD and from the Services in order to fully analyze the results of the more complex models before ultimately determining model strengths and weaknesses.

A wide range of variables was considered in the course of modeling health care costs. Modeling efforts included variables such as:

- inpatient work units (IWUs);
- ambulatory work units (AWUs);
- IWUs associated with long-stay outlying bed days;
- Service branch;
- intensity of the graduate medical education (GME) program;

- the proportion of workload that was to active duty beneficiaries;
- the proportion of workload within obstetrical/gynecological clinical areas;
- whether a facility was located at a remote facility or on a training base; and
- for overseas facilities, whether the facility was located in the Pacific DoD region.

The general form of the regression model whose parameters were estimated was:

$$\text{MEPRS\$} = (B_0 + B_1 \cdot \text{MWU} + \text{Base Adjustments}) * (\text{Other Adjustments}).$$

The dependent variable, MEPRS\$, was the appropriate MEPRS expense for the given model (inpatient nonclinician, inpatient clinician, or ambulatory). The medical work unit variable (MWU) represents facility workload, either IWUs or AWUs, depending upon the expense being modeled. The coefficients, B_0 and B_1 are parameters estimated by the regression: B_0 is the intercept term, or fixed cost, and B_1 is the marginal expense per IWU or AWU. "Base Adjustments" refers to adjustments that were modeled as elements of the base part of the equation, such as the workload attributable to long-stay outliers. "Other Adjustments" refers to adjustments that were modeled as elements that affected the cost of health care in a percentage manner, such as Service branch and GME variables.

GME was modeled as a percentage adjustment in order to allow direct comparison with the GME adjustments measured and employed by Medicare. One reason for modeling Service branch adjustments as percentage adjustments, rather than additive, was that there were usually very few observations for any given facility type. A Navy adjustment, for instance, could either be incorporated as an adjustment to the cost per IWU alone (a slope effect, leaving the intercept term unchanged for the Navy), or

as an adjustment to the constant term alone (an intercept effect, leaving the cost per MWU unchanged), or both. Factoring in both effects, for all desired adjustments, would quickly result in there being too many parameters to be estimated with acceptable accuracy. Including Service branch adjustments as percentage adjustments to the base equation allowed both the intercept and the slope to vary (in the same direction and by the same percentage), while only using one variable, and provided a result that was readily interpreted. Finally, it should be noted that both sides of the regression equation were weighted by one over the square root of the primary workload variable (IWUs or AWUs) prior to estimation in order to correct for heteroscedasticity.

As an example, an inpatient nonclinician equation incorporating an adjustment to the base allowing estimation of a different per diem credit for outliers and Service branch percentage adjustments would be written as:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU} + B_2 \cdot \text{IWU}_0) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF})$$

where:

INPNONC\$ is the observed MEPRS inpatient nonclinician expense;

IWU is the level of IWUs;

IWU_0 is the level of IWUs attributable to outlying bed days;

D_NAVY is a dummy variable equal to 1 if a given facility is a Navy facility, and equal to 0 otherwise; and

D_USAF is a dummy variable equal to 1 if a given facility is an Air Force facility, and equal to 0 otherwise.

For the sake of clarity, this equation and all others in this report do not include the workload weighing factors. The interpretation of the parameters is as follows:

B_0 is the fixed cost for Army facilities;

B_1 is the marginal cost of each IWU at Army facilities;

B_2 is the difference between the marginal cost of IWUs derived from outlying bed days and other IWUs;

C_1 is the percentage adjustment required to the base for Navy facilities: if $C_1 = 20\%$, then for the Navy, fixed costs are estimated to be 1.2 times as great as B_0 , expense per IWU is 1.2 times as great as B_1 , and the difference in the marginal cost between outlying bed day IWUs and other IWUs is 1.2 times as great as B_2 ; and

C_2 is the percentage adjustment required to the base for Air Force facilities.

Adding Service branch dummy variables allows the investigation and implementation of Service branch specific models. Note that the model representing Army costs would consist of the base equation, not multiplied by any percentage adjustments. The marginal cost referred to above is the cost of performing one more IWU, given a certain level of IWUs already performed. Finally, note that Service branch specific models result in a negligible shifting of resources across Services, except in cases where one or more facilities were excluded from the modeling, but included in the allocation process.

The following chapters will discuss specific issues involved with estimating and interpreting the regression analyses for inpatient non-clinician expense, clinician salaries, and ambulatory expenses. Unless otherwise noted, the IWU measure in each model was constructed using trim points computed from all facilities' data, and with 60% per diem credit given to outlying bed days.¹

¹See DRG Workload Credit, VRI-HMS-1 WP90-3, 15 February 1990.

2.0 REGRESSION ANALYSIS: INPATIENT NONCLINICIAN EXPENSES

As noted in chapter 1.0, the modeling effort addressed three categories of hospital expenses: inpatient nonclinician, inpatient clinician, and outpatient or ambulatory expenses. This chapter presents a detailed discussion of the inpatient nonclinician expense modeling and is organized into four sections. Section 2.1 presents the method for computing IWUs and inpatient nonclinician expenses. Section 2.2 provides the methodology and results of the medical center modeling. Sections 2.3 and 2.4 provide the same discussion for CONUS community hospitals and overseas hospitals, respectively.

2.1 COMPUTING EXPENSES AND WORKLOAD

The computation of inpatient nonclinician expenses is facilitated by the fact that inpatient physician salaries are separately identified in the MEPRS data. These expenses are reported as "clinician salaries" and include physicians, interns, and residents. Salary expenses are "for those clinicians whose services are normally provided in the civilian sector by clinicians not employed by the hospital and who bill the patient directly."¹ For each facility, these expenses are summed across all MEPRS inpatient workcenters to provide total inpatient clinician salaries for each MTF. The result is subtracted from the total inpatient expenses summed across all inpatient accounts for each MTF, resulting in total inpatient nonclinician expenses. The inpatient nonclinician expenses for each Service are presented in the table below.

¹Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities, DoD 6010.13-M, ASD(HA), January 1986.

FY88 NONCLINICIAN EXPENSES, BY SERVICE BRANCH
(Expenses in Thousands)

ARMY	\$875,492	43.2%
NAVY	\$466,954	23.1%
AIR FORCE*	\$681,068	33.7%
	<hr/>	<hr/>
DoD TOTAL	\$2,023,514	100%

*Air Force totals include Brooke AMC as part of the
San Antonio Joint Military Medical Command (JMMC)

The workload basis for modeling inpatient nonphysician expenses and inpatient physician salaries is the IWU. IWUs are computed as the product of a facility's Relative Case-Mix Index (RCMI), computed from each Service's Biometrics data, and its dispositions, as reported in the MEPRS data. The precise method of computing the RCMI is presented in exhibit 2-1. Credit given to a particular patient stay is determined by a base weight assigned to the DRG in question combined with adjustments for unusually long or short lengths of stay. The DRG weights employed represent modified CHAMPUS DRG weights, and reflect the relative resource intensity of each DRG with respect to inpatient nonprofessional services. The sum of the weighted dispositions and adjustments is referred to as the number of Relative Weighted Products (RWPs); the total number of RWPs divided by the number of dispositions is termed the Case-Mix Index (CMI). Thus the CMI is the average number of RWPs per disposition. Finally, the CMI is divided by the FY85 DoD average CMI to form the Relative Case-Mix Index (RCMI), relating each facility's average case complexity to the average FY85 DoD disposition.

Applying the methodology for computing IWUs to FY88 MEPRS data resulted in the values presented in the table below. In the aggregate, the Army produces just under half of all IWUs for the DoD, the Air Force

EXHIBIT 2-1: RWP AND RCMI CALCULATION METHODOLOGY

1. Version of DRG Grouper: 4.0

2. DRG Base Weights

- Taken primarily from CHAMPUS as published in the 1 September 1987 Federal Register and based upon CHAMPUS hospital claims for the period 1 July 1986 through 30 June 1987. HCFA version 4.0 weights, adjusted by a factor of 1.07927, were used for DRGs where CHAMPUS weights were not calculated (primarily psychiatric and substance abuse DRGs).

3. Geometric Mean Length of Stay (GLOS) and Trim Point Calculation Methodology

- eliminate zero bed day discharges;
- eliminate one day transfer discharges;
- eliminate discharges where LOS is outside the 5th and 95th percentiles;
- form the natural logarithm of LOS;
- compute mean and standard deviation of the logged LOS;
- compute logged trim points using plus and minus 1.96 standard deviations;
- unlog the logged trim points and mean to form the geometric mean LOS (GLOS) and preliminary trim points;
- if trim is more than 17 days from GLOS, change to exactly 17 days; and
- round low trim upward and high trim downward to nearest integer.

4. Per Diem Weights

- defined as the base DRG weight divided by the GLOS

5. Relative Weighted Product (RWP) Calculation

Direct admissions and births not transferred out, and all transfer in cases:

- inliers: credited with base DRG weight;
- short-stay outliers: 200 percent of the per diem weight for each day, with the total not to exceed the base weight; and
- long-stay outliers: base weight plus 60 percent of the per diem weight for each day beyond the upper trim point.

Direct admissions and births that are transferred out:

- inliers and short-stay outliers: per diem weights for each day but with a total not to exceed the base DRG weight; and
- long-stay outliers: base weight plus 60 percent per diem (as above).

Exceptions:

- DRGs 469 (invalid Dx) and 470 (not groupable):
-- no RWP credit
- DRGs 385 (neonates, died or transferred) and 456 (burns transferred to another acute care facility):
-- short-stay outliers treated as inliers.

6. Case Mix Index (CMI) Calculation

- $CMI = RWP_s / (\text{Dispositions excluding DRGs 469 and 470})$

7. Relative Case Mix Index (RCMI) Calculation

- $RCMI = CMI / .8109$ (so that DoD RCMI = 1.0 in FY85)

follows with approximately one-third of DoD IWUs and the remainder are provided by Navy MTFs.

FY88 INPATIENT WORK UNITS, BY SERVICE BRANCH

ARMY	425,037	45.5%
NAVY	194,195	20.8%
<u>AIR FORCE*</u>	<u>315,196</u>	<u>33.7%</u>
DoD TOTAL	934,428	100%

*Air Force totals include Brooke AMC as part of the San Antonio Joint Military Medical Command (JMMC)

2.2 MEDICAL CENTER REGRESSION MODELS AND RESULTS

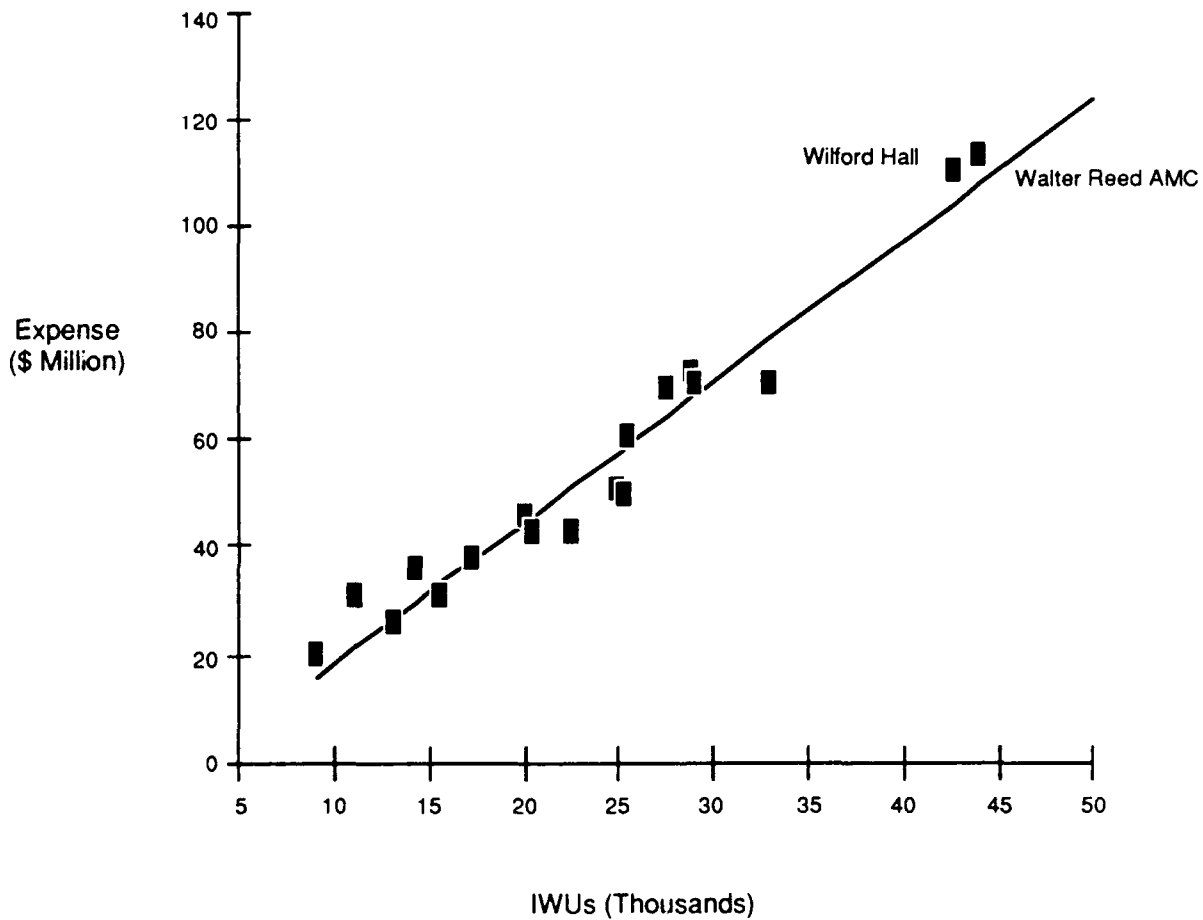
This section contains three subsections. The first discusses the initial medical center inpatient nonclinician models. Section 2.2.2 discusses the background and research involved in determining the proper adjustment for indirect GME costs. Section 2.2.3 contains the final model estimated for medical centers and chosen for application and further analysis in chapter 5.0.

2.2.1 INITIAL MEDICAL CENTER MODELS

As a preliminary step in the modeling process, a scatter plot of all medical centers was formed, displaying inpatient nonclinician expenses and IWUs for each facility. The scatter plot for FY88 Medical Center data is presented in exhibit 2-2. Note that the solid line represents the line which best fits the data for all medical centers, taken together, in terms of minimizing the sum (across all facilities) of the squares of the difference between each facility's observed expenses and the level of expenses represented by the line. Wilford Hall Medical Center and Walter Reed AMC are separately identified in the scatter plot

EXHIBIT 2-2: INITIAL SCATTER DIAGRAM OF MEDICAL CENTER
INPATIENT NONPHYSICIAN EXPENSE

Medical Centers - Ali Services



because they have far more IWUs and much higher expenses than other medical centers.

A number of inpatient nonclinician models were estimated for medical centers. A summary of the model forms is provided in the table below.

SUMMARY OF MODEL FORMS: MEDICAL CENTER INPATIENT NONCLINICIAN EXPENSE

MODEL PARAMETRIC FORM

- 1 $B_0 + B_1 \cdot IWU$
- 2 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 3 $(B_0 + B_1 \cdot IWU) * (1 + C_3 \cdot GME_9)$
- 4 $(B_0 + B_1 \cdot IWU) * (1 + C_4 \cdot GME_95)$
- 5 $(B_0 + B_1 \cdot IWU + B_2 \cdot IWU_0) * (1 + C_3 \cdot GME_9)$
- 6 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot GME_9)$
- 7 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot GME_9)$
- 8 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_4 \cdot GME_95)$
- 9 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + 4.00 \cdot GME_95)$
- 10 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + 4.00 \cdot GME_95)$
 $* (1 + C_5 \cdot D_WRWH)$
- 9a $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + 4.00 \cdot GME_95)$

NOTES:

Models 7 and 8 were estimated for medical centers and CONUS community hospitals combined.

The GME_95 coefficient in models 9, 10, and 9a was constrained to equal 4.00 percent.

Walter Reed AMC and Wilford Hall Medical Center were eliminated from modeled facilities for estimating model 9a parameters.

The regression results for selected models are presented in exhibit 2-3, with interpretation of the models provided in the remainder of this section. An asterisk for any given coefficient indicates that it is statistically different from zero at a five percent level of statistical significance. The standard error of the estimate (SEE) for any given model is an average measure of how much variation in facility expense is not explained by the model, taking into account both the number of MTFs

EXHIBIT 2-3: SUMMARY OF SELECTED RESULTS FOR MEDICAL CENTER NONCLINICIAN EXPENSE MODELS

Variables	Model										
	1	2	3	4	5	6	7	8	9	10	9a+
Base (\$000)											
INTERCEPT	-4,139	-4,358	-2,847	-2,847	-871	-2,736	651	651	-2,239	1,843	2,335
IWU	2,470	2,450	2,205	2,205	1,812	2,118	1,809	1,809	2,012	1,781	1,775
IWU_Q					1,083						
Percentage Adjustments											
D_NAVY		2.58				-1.48	9.12	9.12	2.83	.09	-.08
D_USAF		2.11				3.01	2.92	2.92	3.38	-0.07	-2.46
GME_9			2.22		3.14	3.05	4.25				
GME_95				2.10				4.03	4.00	4.00	4.00
D_WRWH										18.22	
Standard Error of Estimate	38,960	41,409	39,111	39,111	38,248	41,545	27,339	27,339	41,409	29,236	30,074

*Statistically different from zero at P = .05 level of significance.

+Model 9a was chosen as the final model for application and analysis.

Notes:

Models 7 and 8 were estimated for medical centers and CONUS community hospitals combined.

Walter Reed AMC and Wiford Hall Medical Center were eliminated from modeled facilities for estimating model 9a parameters.

The GME_95 coefficient in models 9, 10, and 9a was constrained to equal 4.00 percent.

and the number of variables in the model. A model with a low SEE explains more variation in facility expense, on average, than a model with a high SEE. Finally, it should be noted that coefficients under the "Base Variable" category should be interpreted as thousands of dollars (the intercept term for model 1 [-4,139] indicates an estimated intercept of \$-4,139,000, while the IWU coefficient [2.470] represents a marginal cost of \$2,470 for each IWU). The coefficients under the "Percentage Adjustment" category represent proportions (the D_NAVY coefficient for model 2 [2.58] indicates that Navy medical centers would require an estimated 2.58% more dollars to treat any given level of IWUs than Army medical centers).

Model 1

Form of model:

$$\text{INPNONC\$} = B_0 + B_1 * \text{IWU};$$

where:

INPNONC\$ = inpatient nonclinician expenses;

IWU = inpatient work units.

In model 1, in addition to the intercept term, the only variable included to explain the cost of health care in medical centers was IWUs. Therefore, all differences in costs were forced upon the IWU coefficient. This model stated that the cost of a marginal IWU was \$2,470. The intercept, while fairly large and negative, was not statistically different from zero.

Model 2

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 * \text{IWU}) * (1 + C_1 * \text{D_NAVY}) * (1 + C_2 * \text{D_USAF});$$

where:

D_NAVY = 1 for Navy facilities;
0 otherwise;

D_USAF = 1 for Air Force facilities; and
0 otherwise.

In model 2, Service branch percentage adjustments were added to the model. According to this model, there was a 2.58 percent difference between Navy and Army costs (both fixed and marginal) and a 2.11 percent difference between Air Force and Army costs. As indicated in the exhibit, neither Service branch coefficient was statistically different from zero. Note that the Army version of the model is equal to the base portion of the equation, with no multiplier. The intercept term, as in model 1, was large and negative, but not statistically different from zero. The IWU coefficient was similar to that for model 1. The SEE, relative to model 1, had increased.

Model 3

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 * \text{IWU}) * (1 + C_3 * \text{GME_9});$$

where:

GME_9 = GME program intensity, computed as:

$$[10 * (\# \text{ of residents plus interns})] / (\text{ADPL} / .9);$$
 and
 ADPL represents average daily patient load.

This specification explicitly incorporates GME in order to measure the indirect costs associated with GME. The denominator, (ADPL/.9), is a measure of the "active" bed size of the hospital. The measure is based upon average daily patient load (ADPL) divided by an estimated occupancy rate of 90 percent. This measure was used because reliable data on MTF bed size corresponding to civilian definitions of bed size were not available. It was thought that ADPL would be a better indicator of bed

size. The denominator of .9 was derived from the final report of "Validation/Revision of the DoD Medical Space Planning Criteria."¹ There it was reported that for facilities with 101-250 ADPL, an occupancy rate of 90% should be expected in planning numbers of beds. The medical centers included here are among the largest MTFs in the DoD, in terms of ADPL, and most actually had higher ADPLs than 250 in FY88. Therefore, .9 was used in inflating ADPL to bed size for this regression. A conversion factor of .95, recommended in Functional Criteria for ADPL greater than 250, was also used. The results from that factor will be presented in model 4, below. In future modeling attempts, a more continuous variable may be used.

This measure of GME intensity was an attempt to replicate the measure employed in the Medicare and CHAMPUS programs, which reimburse the indirect costs of GME by paying a given percentage of inpatient nonprofessional costs multiplied by the number of tenths of a resident per bed employed by the hospital. The GME coefficient in this model indicated that, historically, medical centers have been reimbursed 2.22 percent per tenth of a resident per bed, using the definition of bed size employed here. However, this coefficient was not statistically different from zero.

As with the previous two models, only the IWU coefficient was statistically significant. Also, note that the magnitude of both the intercept term and the IWU coefficient dropped appreciably as a result of including the GME variable.

¹Volume II, Functional Criteria, Contract no. MDA 903-85-C-0238, April, 1986, p. 12.

Model 4

Form of model:

$$INPNONC\$ = (B_0 + B_1 * IWU) * (1 + C_4 * GME_95);$$

where:

$$GME_95 = \text{GME program intensity, computed as:} \\ (10 * (\# \text{ of residents plus interns})) / (ADPL / .95).$$

This model specification is identical to that for model 3, except that the bed size variable is ADPL/.95, rather than ADPL/.9. Note that the coefficients did not differ very much from those observed for model 3, implying that the parameter estimates are not very sensitive to small changes in the bed size measure.

Model 5

Form of model:

$$INPNONC\$ = (B_0 + B_1 * IWU + B_2 * IWU_0) * (1 + C_3 * GME_9);$$

where:

$$IWU_0 = \text{the number of IWUs associated with outlying bed days.}$$

This model specification attempted to examine differences in the cost per inlier IWUs compared to that for outlier IWUs. Another way of representing the base portion of the equation is

$$B_0 + B_1 * IWU_I + (B_1 + B_2) * IWU_0;$$

where:

$$IWU_I = \text{IWUs attributable to inlier bed days.}$$

Therefore, if B_2 were greater than 0, it would imply that the current outlier credit system did not give enough weight to outlying bed days in order to adequately account for MTF inpatient nonclinician costs: an "outlying IWU" would be more expensive than an "inlying IWU". If B_2

were equal to zero, then no change in outlier credit is needed. If B_2 were less than zero, then less outlier credit should have been given. Finally, if B_1+B_2 were negative, then negative credit should be given to outlying bed days. Furthermore, the magnitude of B_2 could be used to compute the outlier credit that results in predicted budgets being as close as possible to actual budgets, in the sense of minimizing the sum of the squared differences between the actual and predicted budgets.

The coefficient for outlier IWUs, B_2 , was not statistically different from zero. It was also fairly large, implying that the optimal outlier credit for outlying bed days was 95 percent.¹ Given that outlying bed days are generally recognized as requiring much less resources than initial bed days, one would tend to reject this as a sensible estimate to apply. Therefore, this specification of the model was rejected.

Model 6

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{GME_9}).$$

In this specification, the Service branch dummy variables have been reinserted into the model. As a result of including the GME variable, the Navy term became negative, while the Air Force coefficient increased in magnitude, relative to model 2. This indicates that there are differences among the Services in general GME program intensity. This result provides an argument for leaving these variables in, even though they are not statistically different from zero.

¹This statistic was obtained from the formula: $A_0 = a_0 \cdot (B_1 + B_2) / B_1$, where A_0 is the optimal outlier credit, and a_0 was the per diem outlier credit actually applied in computing RWP's (60 percent).

2.2.2 DETERMINING THE INDIRECT GME ADJUSTMENT

In model 6 above, in which both GME program intensity and Service branch are included, the GME coefficient was 3.04 percent. Preliminary HCFA research found that the adjustment for indirect GME costs should be 5.795 percent for each .1 increase in the intern-to-bed ratio. CHAMPUS reimbursement also includes this figure. However, after explicitly adjusting for hospitals treating a disproportionate share of low-income Medicare patients, it was determined that the average cost per Medicare discharge increased by 4.05 percent for each .1 increase in the intern-to-bed ratio.

One of the main differences between the estimation method employed in determining the Medicare GME adjustment and the methodology outlined here for DoD medical centers was that the HCFA research included all hospitals, while that outlined here included only DoD medical centers. In order to determine the comparability to HCFA estimates, it was decided to include CONUS community hospitals in the estimation of a DoD adjustment, as well as medical centers. The form of the model was as specified above for model 6. Two models were estimated, one using ADPL/.9 as the bed size measure, and one using ADPL/.95 as the bed size measure:

Model 7

Form of model:

$$(B_0 + B_1 * IWU) * (1 + C_1 * D_NAVY) * (1 + C_2 * D_USAF) * (1 + C_3 * GME_9).$$

Model 8

Form of model:

$$(B_0 + B_1 * IWU) * (1 + C_1 * D_NAVY) * (1 + C_2 * D_USAF) * (1 + C_4 * GME_95).$$

The results are presented in exhibit 2-3 and are summarized below.

	<u>MODEL 7</u>	<u>MODEL 8</u>
<i>Base (\$000)</i>		
Intercept	651	651
IWU	1.809	1.809
<i>Percentage</i>		
<i>Adjustments</i>		
GME_9	4.25%	--
GME_95	--	4.03%
D_NAVY	9.12%	9.12%
D_USAF	2.92%	2.92%

As noted previously, the GME coefficient does not appear to be overly sensitive to the choice of the bed size measure, changing roughly in the same proportion as the denominator in the bed size measure ($.22/4.25 = 5.18$ percent; $.05/.90 = 5.56$ percent). Furthermore, it has no effect on the other parameter estimates. Finally, note the similarity between the percentage adjustment observed here (4.03 percent) and that obtained for Medicare (4.05 percent). This suggests that the indirect costs associated with GME are similar for both Medicare and DoD direct care.

A potential improvement upon this model which could be investigated in the future would be to incorporate a more continuous ADPL-to-beds conversion factor when examining all MTFs.

2.2.3 FINAL MEDICAL CENTER MODEL

Because of the similarity between the indirect GME adjustment measured for both Medicare and the direct care system, it was decided to constrain the GME adjustment coefficient to equal that employed for Medicare. The parameter was rounded to 4.0 percent. This section presents the results of estimating this constrained model for medical centers, which was the model finally adopted. Two forms of the model were estimated, one with all medical centers included equivalently, and one

with a dummy variable for Walter Reed AMC and Wilford Hall Medical Center included in the regression. The forms for these two models were:

Model 9

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 * \text{IWU}) * (1 + C_1 * \text{D_NAVY}) * (1 + C_2 * \text{D_USAF}) * (1 + 4.00 * \text{GME_95}).$$

Model 10

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 * \text{IWU}) * (1 + C_1 * \text{D_NAVY}) * (1 + C_2 * \text{D_USAF}) * (1 + 4.00 * \text{GME_95}) * (1 + C_5 * \text{D_WRWH});$$

where:

$$\text{D_WRWH} = 1 \text{ for Walter Reed AMC and Wilford Hall Medical Center;} \\ 0 \text{ otherwise.}$$

While Walter Reed and Wilford Hall were not extreme outliers from the regression line presented in the scatter diagram, they were suspected of exerting an inordinate amount of influence upon the modeling results. Including a dummy variable for these two facilities allowed a test to determine whether these facilities were statistically different from the other medical centers, in terms of the relationship among inpatient non-clinician expenses, IWUs, Service branch, and GME program intensity. The estimation results of these two models are presented in exhibit 2-3, and are summarized below.

	<u>MODEL 9</u>	<u>MODEL 10</u>
<i>Base (\$000)</i>		
Intercept	-2,239	1,843
IWU	2.012	1.781
<i>Percentage Adjustments</i>		
GME_95 +	4.00%	4.00%
D_NAVY	2.83%	0.09%
D_USAF	3.38%	-0.07%
D_WRWH	---	18.22%

+ Constrained to equal 4 percent in both models.

As noted previously, when observing the scatter diagram of medical center inpatient nonclinician expenses, Walter Reed and Wilford Hall had much higher expenses and many more IWUs than the other medical centers. Model 10 was estimated in order to see how much effect these two facilities may have had on the regression estimates. (Outliers often exercise a great deal of influence upon parameter estimates when least squares estimation is used.)

As seen in the table above, Walter Reed and Wilford Hall departed, on average, from the expenses predicted for them, based upon observing all other facilities, by about 18 percent. Furthermore, this coefficient estimate was statistically different from zero (see exhibit 2-3), implying that these two facilities were statistically different from the other medical centers, in terms of the relationship between inpatient nonclinician expenses and other variables. Therefore, in estimating final model parameters, these two facilities were excluded from the modeling. This final model is model 9a, and the resulting parameter estimates are displayed in the table below.

FINAL MEDICAL CENTER INPATIENT NONCLINICIAN MODEL

	<u>MODEL 9a¹</u>
<i>Base (\$000)</i>	
Intercept	2.235
IWU	1.775
<i>Percentage</i>	
<i>Adjustments</i>	
GME_95 +	4.00%
D_NAVY	-0.08%
D_USAF	-2.46%

+ Constrained to equal 4.00 percent.

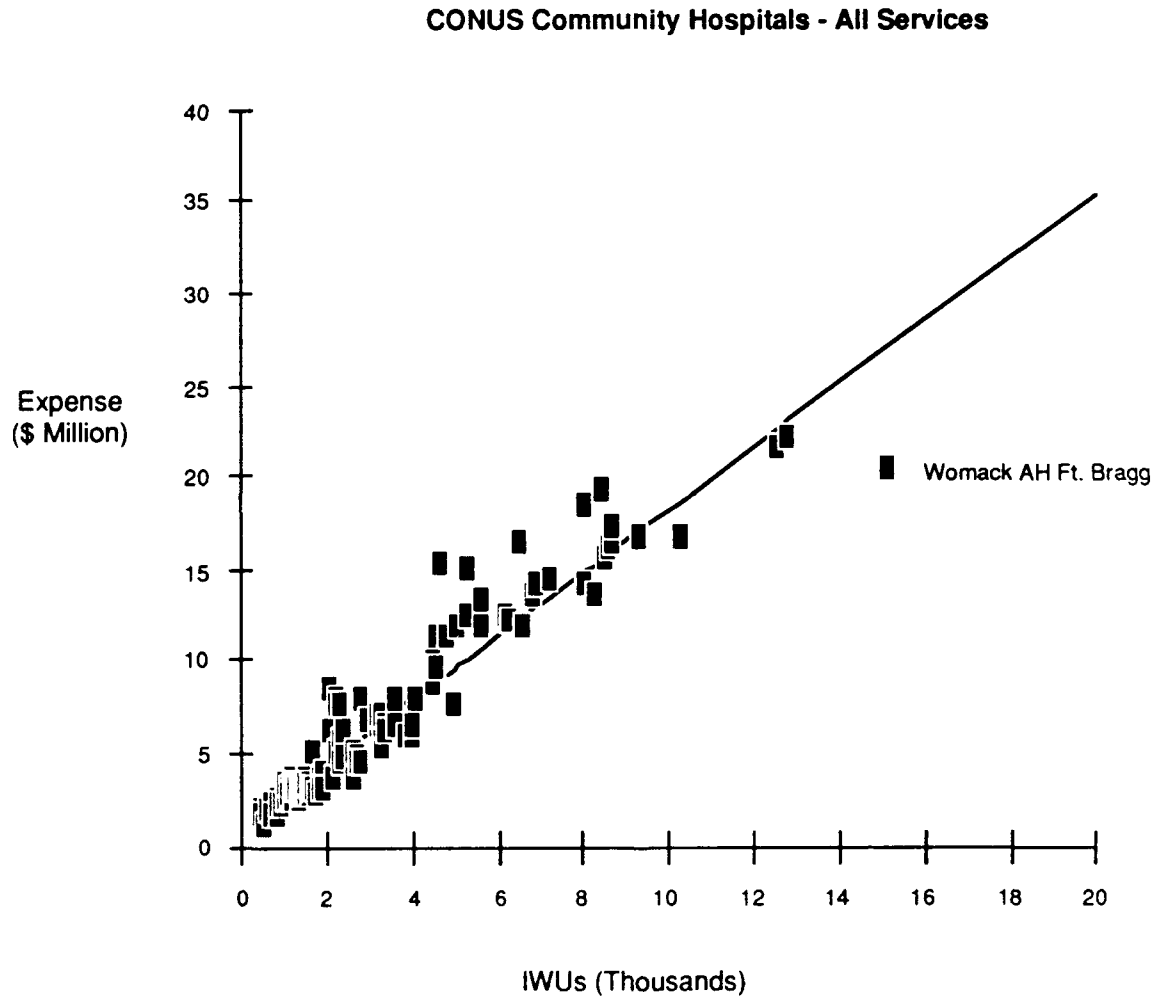
¹ Identical in form to model 9, but with Walter Reed AMC and Wilford Hall Medical Center eliminated from model.

2.3 CONUS COMMUNITY HOSPITAL MODEL AND RESULTS

As with medical centers, a preliminary step in the modeling process for CONUS community hospitals was to form scatter plots displaying the FY88 inpatient nonclinician expenses and IWUs of each facility. This scatter plot is presented in exhibit 2-4. The solid line represents the line which best fits the data for all CONUS community hospitals, taken together, in terms of minimizing the sum (across all facilities) of the squares of the differences between each facility's observed expenses and the level of expenses represented by the line.

As identified in the exhibit, Womack Army Hospital (AH) is the facility to the far right and below the line. Judging from the scatter diagram, this facility was an obvious outlier, relative to the other CONUS community hospitals, in terms of its inpatient nonclinician expenses relative to IWUs. As will be discussed below, while this facility was included in the preliminary modeling analysis, it was eventually eliminated in the final model parameters.

EXHIBIT 2-4: INITIAL SCATTER DIAGRAM OF CONUS COMMUNITY
HOSPITAL INPATIENT NONCLINICAL EXPENSE



The remainder of this section contains two further subsections. Section 2.3.1 presents initial models and estimation results. Section 2.3.2 discusses further investigation of selected models and presents the final CONUS community hospital inpatient nonclinician expense model chosen for application and further analysis.

2.3.1 INITIAL CONUS COMMUNITY HOSPITAL MODELS

As with medical centers, a number of models were investigated for CONUS community hospitals. A summary of the parametric forms of these models is presented in the table below.

SUMMARY OF MODEL FORMS: CONUS COMMUNITY HOSPITAL INPATIENT NONCLINICIAN EXPENSE

MODEL PARAMETRIC FORM

1	$B_0 + B_1 \cdot IWU$
2	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
3	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot GME_9)$
4	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot AD_DISP\%)$ $* (1 + C_4 \cdot OBG_DISP\%)$
5	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_REMOTE)$ $* (1 + C_4 \cdot D_TRAIN)$
6	$(B_0 + B_1 \cdot IWU + B_2 \cdot IWU_0) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
7	$(B_0 + B_1 \cdot IWU + B_2 \cdot IWU^2) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
8	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_LARGE)$
2a	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$

Note: Womack AH was eliminated from modeled facilities for estimating model 2a parameters.

The regression results for selected models are presented in exhibit 2-5. Many of the results were similar to those run for medical centers. Therefore, discussion of the results for these models will not include those models whose forms and interpretations have already been discussed.

EXHIBIT 2-5: SUMMARY OF SELECTED RESULTS FOR CONUS COMMUNITY HOSPITAL
NONCLINICIAN EXPENSE MODELS

	Model									
	1	2	3	4	5	6	7	8	2a+	
Variables										
Base (\$000)										
INTERCEPT	768	677	606	634	679	762	397	588	659	
IWU	1.833	1.707	1.741	1.585	1.700	1.490	2.070	1.790	1.748	
IWU_O						1.985				
IWU ²							-.000039			
Percentage Adjustments										
D_NAVY		32.10	34.53	31.33	32.30	33.15	27.60	32.03	29.62	
D_USAF		4.00	4.43	6.82	4.32	7.14	-1.25	2.40	2.33	
GME_9			-2.78							
AD_DISP%				0.21						
ORG_DISP%				-0.05						
D_REMOTE					-0.20					
D_TRAIN					1.26					
D_LARGE								-6.67		
Standard Error of Estimate	25.248	21.290	21.214	21.175	21.487	20.668	20.558	21.138	20.775	

*Statistically different from zero at P = .05 level of significance.

+Model 2a was chosen as the final model for application and analysis.

Model 1

Form of model:

$$\text{INPNONC\$} = B_0 + B_1 * \text{IWU}$$

The estimated parameters according to this model, implied that the basic fixed cost for a CONUS community hospital, prior to performing any workload was \$768,000, and that each IWU performed cost \$1,833. Both of these parameters were statistically different from zero.

Model 2

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 * \text{IWU}) * (1 + C_1 * \text{D_NAVY}) * (1 + C_2 * \text{D_USAF}).$$

The interpretation of this basic model with Service branch adjustments has been discussed previously, under section 2.2.1.

Model 3

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 * \text{IWU}) * (1 + C_1 * \text{D_NAVY}) * (1 + C_2 * \text{D_USAF}) * (1 + C_3 * \text{GME_9}).$$

In model 3, GME program intensity was modeled, using ADPL/.9 as the bed size measure. As the exhibit indicates, the estimated coefficient was negative, suggesting that increased GME program intensity (measured in terms of tenths of a resident per bed) was associated with less expensive health care delivery. This is counter to theoretical hypothesis and empirical findings for other health care systems, as well as for the DoD medical centers, as discussed earlier. Therefore, GME program intensity was rejected as a possible parameter for explaining CONUS community hospital expenses.

Model 4

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{AD_DISP\%}) * (1 + C_4 \cdot \text{OBG_DISP\%});$$

where:

AD_DISP% = the percentage of dispositions which were active duty beneficiaries; and

OBG_DISP% = the percentage of dispositions which were obstetrical or gynecological in nature.

Both the percentage of dispositions that were for active duty beneficiaries and the percentage of dispositions that were for OB/GYN had coefficients that were statistically different from zero in the previous nonpersonnel modeling effort. Active duty dispositions were obtained from Biometrics data, as reported by the Defense Medical Information System (DMIS). OB/GYN dispositions were obtained from MEPRS data, also reported by the DMIS. The coefficient on AD_DISP% implies that if the percentage of care which is going to active duty beneficiaries rises by one percent, the expenses of a given MTF are expected to rise by .21%. The OBG_DISP% coefficient implies that as the percentage of care being delivered in ob/gyn rises by one percent, the expenses of the given MTF are expected to decline by .05%. However, neither of the coefficients on the two new variables were statistically different from zero, when using MEPRS inpatient nonclinician expenses.

Model 5

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{D_REMOTE}) * (1 + C_4 \cdot \text{D_TRAIN});$$

where:

D_REMOTE = 1 if the MTF was remote;
0 otherwise;

D_TRAIN = 1 if the facility was located on a training base; and
0 otherwise.

This version of the model was run in order to test whether remote facilities or those located on training bases experienced different costs in delivering health care than other MTFs. Facilities were designated remote if there were less than 100 civilian hospital beds within 40 miles.¹ These MTFs are displayed in exhibit 2-6. A facility was designated as being on a training base if the base had basic training or Advanced Individual Training (AIT) or both.² These bases would be characterized as having large numbers of young people there for a short time, who might be expected to require more than average care. These MTFs are displayed in exhibit 2-7. The values of each of these variables were based upon FY85 data. As indicated in the exhibit, neither of the coefficients for these variables were statistically different from zero.

Model 6

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU} + B_2 \cdot \text{IWU}_0) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF});$$

where:

IWU_0 = IWUs associated with outlying bed days.

This model corresponds to medical center model 5 described earlier.

Unlike the results for the medical center model, the results indicate

¹Military Health Services System Planning for 1993, presented to the Resource Analysis and Planning System (RAPS) Steering Group, 19 February 1987.

²Program Documentation for the MHSS Resource Requirements Forecasting Model, VRI-DHA-1 FR81-2, Vector Research, Incorporated, 1 September 1981.

EXHIBIT 2-6: REMOTE MTFs*

DMIS ID	NAME	INSTALLATION
5	Bassett ACH	Ft. Wainwright
7	BRH Navsta Adak	Adak
8	Bliss AH	Ft. Huachuca
19	USAF Hospital Edwards	Edwards AFB
20	831st Medical Group	George AFB
28	NH Lemoore	Lemoore
30	BRH MGAGCC Twenty-nine Palms	Twenty-nine Palms
53	366th Medical Group	Mountain Home AFB
64	Bayne-Jones AH	Ft. Polk
65	42nd Strategic Hospital	Loring AFB
68	NH Patuxent River	Patuxent River
71	379th Strategic Hospital	Wurtsmith AFB
72	410th Strategic Hospital	K.I. Sawyer AFB
75	Wood AH	Ft. Leonard Wood
84	833rd Medical Group	Holoman AFB
98	Reynolds AH	Ft. Sill
104	NH Beaufort	Beaufort
114	USAF Hospital Laughlin	Laughlin AFB
127	NH Oak Harbor	Oak Harbor
131	Weed ACH	Ft. Irwin

*Source: Military Health Services System Planning for 1993.

EXHIBIT 2-7: MTFs LOCATED AT TRAINING FACILITIES*

DMIS ID	NAME	INSTALLATION
2	Noble AH	Ft. McClellan
23	Hays AH	Ft. Ord
29	NH San Diego	San Diego
40	NH Orlando	Orlando
47	Eisenhower AMC	Ft. Gordon
56	NH Great Lakes	Great Lakes
64	Bayne-Jones AH	Ft. Polk
75	Wood AH	Ft. Leonard Wood
82	Walson AH	Ft. Dix
86	Keller AH	West Point
98	Reynolds AH	Ft. Sill
104	NH Beaufort	Beaufort
105	Moncrief AH	Ft. Jackson
108	William Beaumont AMC	Ft. Bliss
117	Willford Hall USAF Med Ctr	Lackland AFB

*Source: Program Documentation for the MHSS Resource Requirements Forecasting Model.

that the CONUS community hospital coefficient on outlying IWUs is statistically different from zero. However, the \$1,965 coefficient on the IWUs from outlying bed days implied that the per diem credit for outlying bed days should be 139 percent. That outlying bed days should be more expensive than inlying bed days goes against the general theoretical understanding of health care provision. Therefore, this specification was rejected as a representation of the cost of health care provision.

Model 7

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU} + B_2 \cdot \text{IWU}^2) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

This formulation hypothesized that there are some returns to scale in delivering health care. If B_2 is greater than zero, then there are decreasing returns to scale: as a facility produces greater levels of IWUs, the cost of additional IWUs goes up. If B_2 is less than zero, it would imply increasing returns to scale; as a facility produces more IWUs, the cost of producing additional IWUs goes down. This model was investigated based upon the results presented in exhibit 2-4. This scatter diagram shows that the largest facilities are below the regression line plotting predicted costs for each level of IWUs, suggesting that CONUS community hospitals may exhibit increasing returns to scale. Consistent with these results, the coefficient on IWU^2 is negative, and statistically different from zero, implying that there are increasing returns to scale. However, Womack AH, with its relatively high level of IWUs and low costs, has a strong influence on these regression results.

Model 8

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) \cdot (1 + C_1 \cdot \text{D_NAVY}) \cdot (1 + C_2 \cdot \text{D_USAF}) \cdot (1 + C_3 \cdot \text{D_LARGE});$$

where:

$$\text{D_LARGE} = 1 \text{ if } (\text{ADPL}/.9) \geq 100; \text{ and} \\ 0 \text{ otherwise.}$$

In model 8, size was inserted as a dummy variable in order to see if there were differences between larger and smaller hospitals in terms of the costs of delivering health care. This was done in order to introduce a basic peer grouping concept for CONUS Community hospitals into the model. As shown in exhibit 2-5, the coefficient on D_LARGE was negative, implying that it was somewhat less expensive, on average, to provide health care in large CONUS community hospitals than in small ones, in terms of inpatient nonclinician costs. While this coefficient was not statistically different from zero at the 5 percent level of significance, it was statistically different from zero with slightly less confidence, at a 10 percent level of significance.

2.3.2 FINAL CONUS COMMUNITY HOSPITAL MODEL

There were a number of models that seemed to explain the variation in inpatient nonclinician expenses among CONUS community hospitals, notably models 2, 7, and 8. There was some concern, however, that the results of the models were overly influenced by the presence of Womack AH in the data, which may have led to model 7 and model 8 appearing superior to the other models, having the lowest standard errors. The main thrust of this modeling effort was to capture the essence of the relationship between expenses, on the one hand, and workload and other variables on the other. The presence of Womack could cause the models to

be nonrepresentative. Therefore, Womack was deleted from the data and model 2 selected as the final model. However, research on this facility and the models presented here should be pursued further when more current data become available, in order to determine whether the relationships observed here hold over time. If further research reveals that more sophisticated models are warranted, and one can appropriately specify these models, they should be adopted.

FINAL CONUS COMMUNITY HOSPITAL INPATIENT NONCLINICIAN MODEL

MODEL 2a¹

<i>Base (\$000)</i>	
Intercept	659
IWU	1.748
<i>Percentage</i>	
<i>Adjustments</i>	
D_NAVY	29.62
D_USAF	2.33

¹Estimated model is identical to model 2, but Womack AH was not included among facilities modeled.

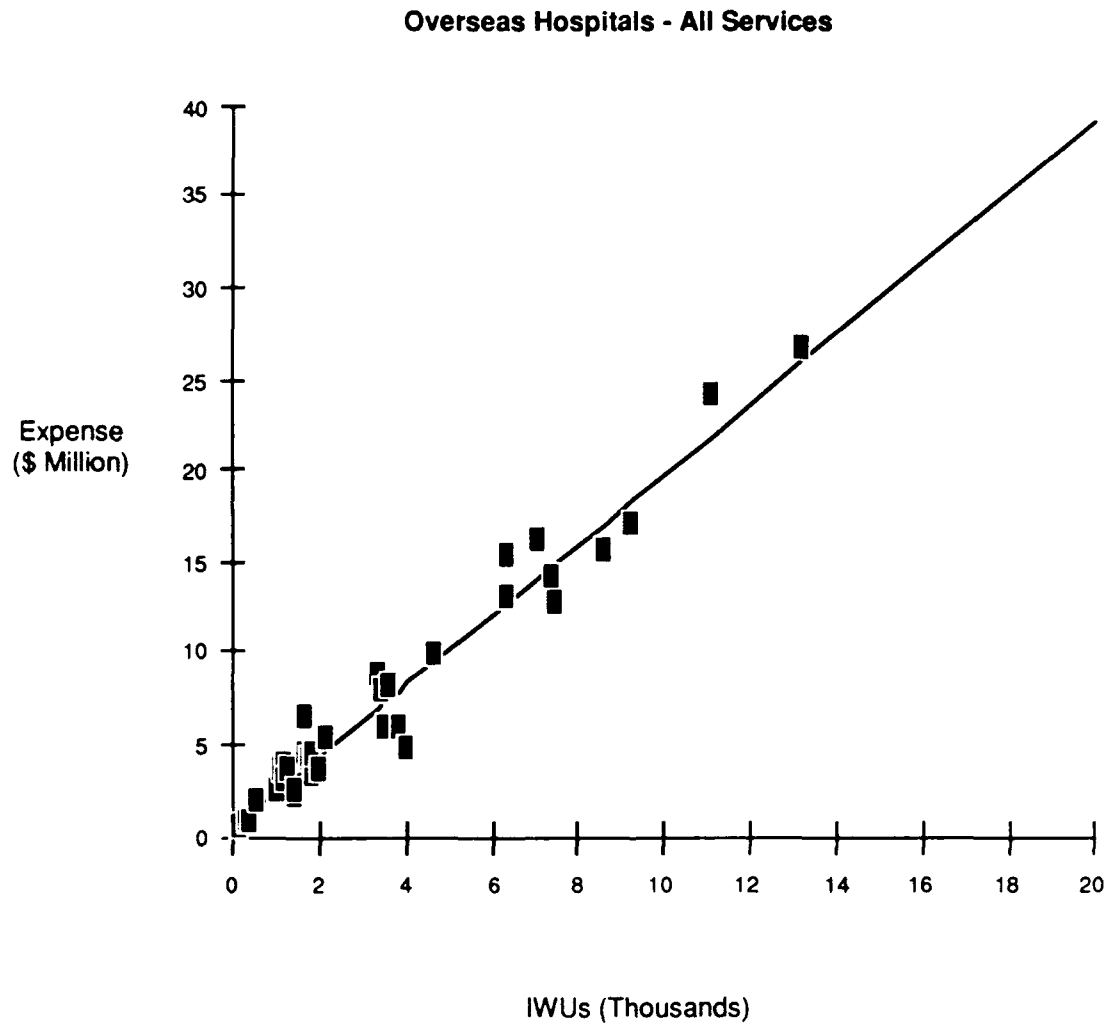
2.4 OVERSEAS HOSPITAL MODELS

As described previously for medical centers and CONUS community hospitals, the first step in modeling overseas hospitals was to form a scatter plot displaying the inpatient nonclinician expenses and IWUs for each facility. This scatter plot is presented in exhibit 2-8. Selected models are presented in the following section. Section 2.4.2 presents the final overseas hospital inpatient nonclinician model chosen for application and further analysis.

2.4.1 INPATIENT OVERSEAS HOSPITAL MODELS

A summary of the parametric forms for all models is presented in the table below.

EXHIBIT 2-8: INITIAL SCATTER DIAGRAM OF OVERSEAS HOSPITAL
INPATIENT NONPHYSICIAN EXPENSE



SUMMARY OF MODEL FORMS: OVERSEAS INPATIENT NONCLINICIAN EXPENSE MODELS

MODEL PARAMETRIC FORM

- 1 $B_0 + B_1 \cdot IWU$
- 2 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 3 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_PACIFIC)$
- 4 $(B_0 + B_1 \cdot IWU + B_2 \cdot IWU_0) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 5 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot AD_DISP\%)$
 $\quad \quad \quad * (1 + C_4 \cdot OBG_DISP\%)$

The regression results for selected overseas hospital models are presented in exhibit 2-9. The forms of most of these models, the variables included, and the interpretation of the estimation results have been discussed with the previous two facility types. Therefore, the discussion will focus on models 2, 3, and 5.

Model 1

Form of model:

$$B_0 + B_1 \cdot IWU$$

The interpretation of this basic model was discussed previously, under section 2.3.1.

Model 2

Form of model:

$$INPNONC\$ = (B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF).$$

This is the form of the model eventually adopted. Both the intercept and the IWU coefficient were statistically different from zero. The Service branch coefficients were not statistically different from zero. However, these coefficients make fundamental sense, they are the best point estimates, and retaining them allowed the maintenance of Service specific models.

EXHIBIT 2-9: SUMMARY OF SELECTED RESULTS FOR OVERSEAS HOSPITAL NONCLINICAL EXPENSE MODELS

Variables	Model				
	1	2+	3	4	5
Base (\$000)					
INTERCEPT	426 *	492 *	465 *	508 *	1,059 *
IWU	1,963 *	1,948 *	1,963 *	1,915 *	2,258 *
IWU_O				.218	
Percentage Adjustments					
D_NAVY		14.36	18.04	14.79	10.41
D_USAF		-9.30	-7.38	-9.46	-13.82
D_FACIFIC			-4.56		
AD_DISP%					-0.59 *
OBG_DISP%					0.36
Standard Error of Estimate	25,280	23,770	24,053	24,165	22,444

*Statistically different from zero at P = .05 level of significance.

+Model 2 was chosen as the final model for application and analysis.

Model 3

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{D_PACIFIC});$$

where:

$$\text{D_PACIFIC} = 1 \text{ for facilities in the DoD Pacific region; and} \\ 0 \text{ otherwise.}$$

In the initial nonpersonnel resource allocation modeling, the Pacific dummy variable turned out to be statistically different from zero. The inclusion here was intended to determine whether the relationship detected with nonpersonnel expenses held true with MEPRS expenses and workloads. As shown in exhibit 2-9, this variable was not statistically different from zero, and therefore was not retained in the inpatient nonclinician modeling.

Model 4

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF})$$

This basic form of the model, with Service branch adjustments, was discussed under section 2.2.1.

Model 5

Form of model:

$$\text{INPNONC\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{AD_DISP\%}) * (1 + C_4 \cdot \text{OBG_DISP\%}).$$

This form of the model is discussed above for CONUS community hospitals. For overseas hospitals, the coefficient for the proportion of care given to active duty beneficiaries is significantly different from zero.

2.4.2 SELECTING THE FINAL OVERSEAS HOSPITAL MODEL

While model 5 had the lowest standard error of any of the models in exhibit 2-9, model 2 was chosen as the final model. Further corroborating research and input from DoD and the Services is desired before determining that the more complex model is actually better. The parameter estimates for model 2 are summarized below.

FINAL OVERSEAS HOSPITAL INPATIENT NONCLINICIAN MODEL

	<u>MODEL 2</u>
<i>Base (\$000)</i>	
Intercept	492
IWU	1.948
<i>Percentage</i>	
<i>Adjustments</i>	
D_NAVY	14.36
D_USAF	-9.30

2-34

3.0 REGRESSION ANALYSIS: INPATIENT CLINICIAN EXPENSES

This chapter presents a detailed discussion of the inpatient clinician expense modeling. The fundamental measure of workload adopted in modeling inpatient clinician expenses was the IWU. The method for computing IWUs and inpatient clinician expense, i.e., salaries, was described in section 2.1. Inpatient clinician expenses for each Service are presented in the table below.

FY88 CLINICIAN SALARIES, BY SERVICE BRANCH
(Expenses in Thousands)

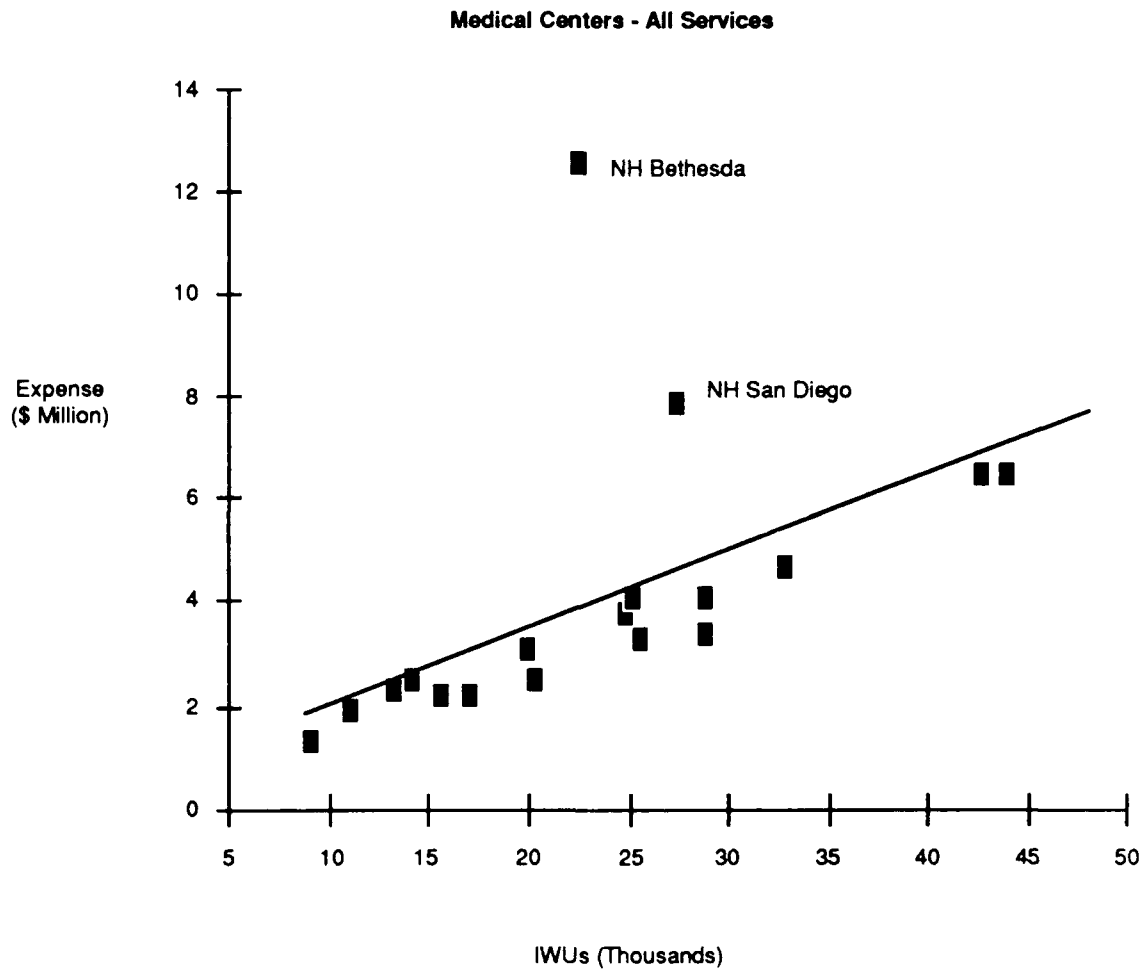
ARMY	\$54,161	40.6%
NAVY	\$42,166	31.6%
AIR FORCE	\$37,173	27.8%
	<u>\$133,499</u>	<u>100.0%</u>

This chapter contains three sections. Section 3.1 provides the methodology and results of the medical center modeling. Sections 3.2 and 3.3 provide the same discussion for CONUS community hospitals and overseas hospitals, respectively.

3.1 MEDICAL CENTER MODELING AND RESULTS

A scatter plot showing the relationship between inpatient clinician salaries and IWUs for each medical center is presented in exhibit 3-1. For the most part, the facilities fall along a straight path. The two obvious outliers are NH Bethesda and NH San Diego. These facilities were eventually eliminated from the modeling. As noted previously, the goal of the present effort was to establish the essence of the relationship between expense and other variables (including workload). Atypical

EXHIBIT 3-1: INITIAL SCATTER DIAGRAM OF MEDICAL CENTER
INPATIENT CLINICIAN SALARIES



facilities such as these can cause the estimated models to be nonrepresentative and need to be investigated further.

Section 3.1.1 presents initial medical center inpatient clinician models. Section 3.1.2 presents the final medical center inpatient clinician model selected for application and further analysis.

3.1.1 INITIAL MEDICAL CENTER MODELS

The table below summarizes the parametric forms of the models investigated.

SUMMARY OF MODEL FORMS: MEDICAL CENTER INPATIENT CLINICIAN EXPENSES

MODEL	PARAMETRIC FORM
1	$B_0 + B_1 \cdot IWU$
2	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
2a	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
3a	$(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot GME_95)$
4a	$(B_1 \cdot D_ARMY \cdot IWU) * (B_2 \cdot D_NAVY \cdot IWU) * (B_3 \cdot D_USAF \cdot IWU)$

Note: Models 2a, 3a, and 4a excluded NH San Diego and NH Bethesda.

Selected models and results from the medical center inpatient clinician salary modeling are presented in exhibit 3-2. The remainder of this section will discuss these models and results.

Model 1

Form of Model:

$$INPMD\$ = B_0 + B_1 \cdot IWU;$$

where:

$$INPMD\$ = \text{inpatient clinician salaries.}$$

Under this basic medical center inpatient clinician model, with no service adjustments, the IWU coefficient was statistically different from zero, but the intercept was not.

EXHIBIT 3-2: SUMMARY OF SELECTED RESULTS FOR MEDICAL CENTER INPATIENT CLINICIAN SALARY MODELS

3-4

Variables	Model			
	1	2	2a**	3a**
Base (\$000)				4a**+
INTERCEPT	125	85	156	216
IWU	0.169 *	0.140 *	0.137 *	0.114 *
D_ARMY*IWU				143 *
D_NAVY*IWU				134 *
D_USAF*IWU				147 *
Percentage Adjustments				
D_NAVY		95.20	-6.59	-8.99
D_USAF		1.85	1.21	2.22
GME_95				3.61
Standard Error of Estimate	15.807	13.798	2.647	2.618
				2.593

*Statistically different from zero at P = .05 level of significance.

**Models 2a, 3a, 4a estimated after NH Bethesda and NH San Diego was deleted from the data.

+Model 4a was chosen as the final model for application and further analysis.

Model 2

Form of model:

$$\text{INPMD\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

Incorporating Service branch into the model reduces both the intercept term and the IWU coefficient. Note that the Navy coefficient of 95.20 percent is probably driven mainly by the combined effect of NH San Diego and NH Bethesda, since these are two out of the four Navy medical centers and their expenses were substantially higher than those of other medical centers.

Model 2a

Form of model:

$$\text{INPMD\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF});$$

where:

NH San Diego and NH Bethesda have been eliminated from the medical centers included in the modeling.

One of the most striking results of this model is that the percentage adjustment for Navy facilities has become negative, a major change in comparison to its estimate in model 2. This is evidence of the degree to which the two eliminated facilities influenced the results of the estimation in model 2. Unfortunately, eliminating these two facilities left only two Navy facilities, which is a very small sample size upon which to base the allocation models.

Model 3a

Form of model:

$$\text{INPMD\$} = (B_0 + B_1 \cdot \text{IWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{GME_95});$$

where:

NH San Diego and NH Bethesda were deleted from the data used in the modeling;

GME_95 is the number of tenths of a resident and interns, divided by (ADPL/.95).

The coefficient on GME_95 indicates that for each additional .1 resident or intern per bed, clinician salaries increase by 3.61 percent. The coefficient, however, is not statistically different from zero. In the absence of strong statistical evidence or need for comparison to other health care reimbursement systems, this variable was not retained for further inpatient clinician modeling. As a final observation, note the large drop in the SEE as a result of eliminating NH San Diego and NH Bethesda in models 2a, 3a, and 4a.

Model 4a

Form of model:

$$\text{INPMDS} = B_1 * D_{\text{NAVY}} * \text{IWU} + B_2 * D_{\text{USAF}} * \text{IWU} + B_3 * D_{\text{ARMY}} * \text{IWU};$$

where:

$D_{\text{ARMY}} = 1$ for Army MTFs;
0 otherwise; and

NH San Diego and NH Bethesda were deleted from the data used in the modeling.

This model was estimated in response to the fact that the intercept term was not statistically different from zero. This form of the model constrains the intercept to equal zero and inserts a Service branch dummy variable for the Army. The coefficients represent the marginal medical center inpatient clinician cost per IWU. Since there is no intercept term, the coefficients represent the average costs as well.

3.1.2 FINAL MEDICAL CENTER MODEL

Model 4a was selected as the final medical center inpatient clinician model. As will be seen in the following sections, no facility type demonstrated an intercept term that was statistically different from zero. Therefore, this zero-intercept form of the model was chosen over that of model 2a. The model parameters are summarized below.

FINAL MEDICAL CENTER INPATIENT NONCLINICIAN MODEL

MODEL 4a¹

D_ARMY*IWU	\$143
D_NAVY*IWU	\$134
D_USAF*IWU	\$147

¹Estimated model did not include NH Bethesda or NH San Diego.

3.2 CONUS COMMUNITY HOSPITAL MODELING AND RESULTS

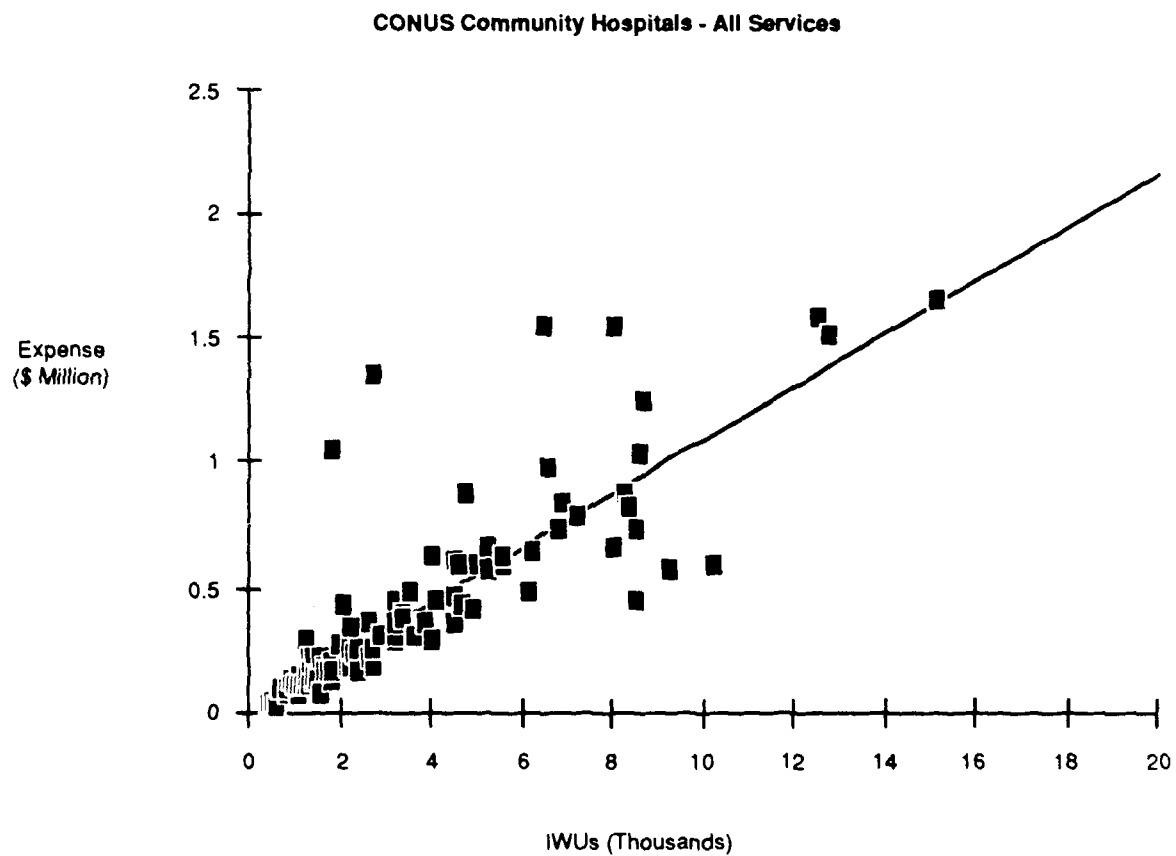
A scatter plot showing the relationship between inpatient clinician salaries and IWUs for each CONUS community hospital is presented in exhibit 3-3. The table below displays the forms of the inpatient clinician models that were examined in the modeling process.

SUMMARY OF MODEL FORMS: CONUS COMMUNITY HOSPITAL INPATIENT CLINICIAN EXPENSES

MODEL PARAMETRIC FORM

- | | |
|---|--|
| 1 | $B_0 + B_1 * IWU$ |
| 2 | $(B_0 + B_1 * IWU) * (1 + C_1 * D_NAVY) * (1 + C_2 * D_USAF)$ |
| 3 | $(B_0 + B_1 * IWU + B_2 * IWU_0) * (1 + C_1 * D_NAVY) * (1 + C_2 * D_USAF)$ |
| 4 | $(B_0 + B_1 * IWU) * (1 + C_1 * D_NAVY) * (1 + C_2 * D_USAF) * (1 + C_3 * AD_DISP\%) * (1 + C_4 * OBG_DISP\%)$ |
| 5 | $(B_0 + B_1 * IWU) * (1 + C_1 * D_NAVY) * (1 + C_2 * D_USAF) * (1 + C_3 * D_REMOTE) * (1 + C_4 * D_TRAIN)$ |
| 6 | $(B_1 * D_ARMY * IWU) + (B_2 * D_NAVY * IWU) + (B_3 * D_USAF * IWU)$ |

EXHIBIT 3-3: INITIAL SCATTER DIAGRAM OF CONUS COMMUNITY HOSPITAL
INPATIENT CLINICIAN SALARIES



The remainder of this section will discuss these models and results in an overall manner. The variables included in these models and the interpretation of their coefficients have already been covered in the medical center model discussion above, as well as in the CONUS community hospital inpatient nonclinician expense modeling discussion in section 2.3.1. A summary of the modeling results is presented in exhibit 3-4.

As with medical centers, the intercept terms in the regression estimates were not statistically different from zero. IWUs, IWU-Service branch interaction terms, and the Navy dummy variable were the only variables for which coefficient estimates were statistically different from zero. Other variables, such as the level of IWUs associated with outlying bed days, the percentage of care to active duty beneficiaries, the percentage of care which was ob/gyn in nature, whether the MTF was located on a training base, or whether the MTF was remote, were not statistically proven to help explain differences in inpatient clinician costs across facilities. For these reasons, and for the previously noted fact that the intercept term was never statistically different from zero for any facility type for inpatient clinician salaries, the model finally selected for implementation was model 6:

$$\text{INPMD\$} = B_1 * D_NAVY * IWU + B_2 * D_USAF * IWU + B_3 * D_ARMY * IWU.$$

This model contains no intercept term, and has a different marginal cost per IWU for each Service. This model corresponds to that chosen for medical centers, and, as will be demonstrated below, that chosen for overseas facilities as well. The parameter estimates for the final model are summarized below.

EXHIBIT 3-4: SUMMARY OF SELECTED RESULTS FOR CONUS COMMUNITY HOSPITAL INPATIENT CLINICIAN SALARY MODELS

Variables	Model					
	1	2	3	4	5	6+
Base (\$000)						
INTERCEPT	-6	7	4	-3	17	
IWU	0.113 *	0.101 *	0.108 *	0.063 *	.097 *	
IWU_O			-0.061			0.103 *
D_ARMY*IWU						0.160 *
D_NAVY*IWU						0.095 *
D_USAF*IWU						
Percentage Adjustments						
D_NAVY		54.84 *	54.16 *	66.44 *	56.82 *	
D_USAF		-9.01	-10.47	-13.04	-8.26	
AD_DISP%				-0.05		
OBG_DISP%				3.24		
D_REMOTE					-14.48	
D_TRAIN					16.10	
Standard Error of Estimate	3.352	3.041	3.051	2.825	3.044	3.029

*Statistically different from zero at P = .05 level of significance.

+Model 6 was chosen as the final model for application and further analysis.

FINAL CONUS COMMUNITY HOSPITAL INPATIENT CLINICIAN MODEL

MODEL 6

D_ARMY*IWU	\$103
D_NAVY*IWU	\$160
D_USAF*IWU	\$ 95

3.3 OVERSEAS HOSPITAL MODELING AND RESULTS

A scatter plot showing the relationship between inpatient clinician salaries and IWUs for each overseas hospital is presented in exhibit 3-5. While there is some dispersion, it appears to be relatively little, when compared to that for CONUS community hospitals. The parametric forms of the overseas inpatient clinician models considered are summarized below.

SUMMARY OF MODEL FORMS: OVERSEAS INPATIENT CLINICIAN EXPENSES

MODEL PARAMETRIC FORM

- 1 $B_0 + B_1 \cdot IWU$
- 2 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 3 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_PACIFIC)$
- 4 $(B_0 + B_1 \cdot IWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot AD_DISP\%)$
 $* (1 + C_4 \cdot OBG_DISP\%)$
- 5 $(B_0 + B_1 \cdot IWU + B_2 \cdot IWU_0) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 6 $(B_1 \cdot D_ARMY \cdot IWU_0) * (B_2 \cdot D_NAVY \cdot IWU_0) * (B_3 \cdot D_USAF \cdot IWU_0)$

Selected models and results from the overseas hospital clinician salary modeling are presented in exhibit 3-6. The variables included in these models and the interpretation of their coefficients have already been covered in the clinician modeling discussion above, as well as in the overseas inpatient nonclinician expense modeling discussion in

EXHIBIT 3-5: INITIAL SCATTER DIAGRAM OF OVERSEAS HOSPITAL
INPATIENT CLINICIAN SALARIES

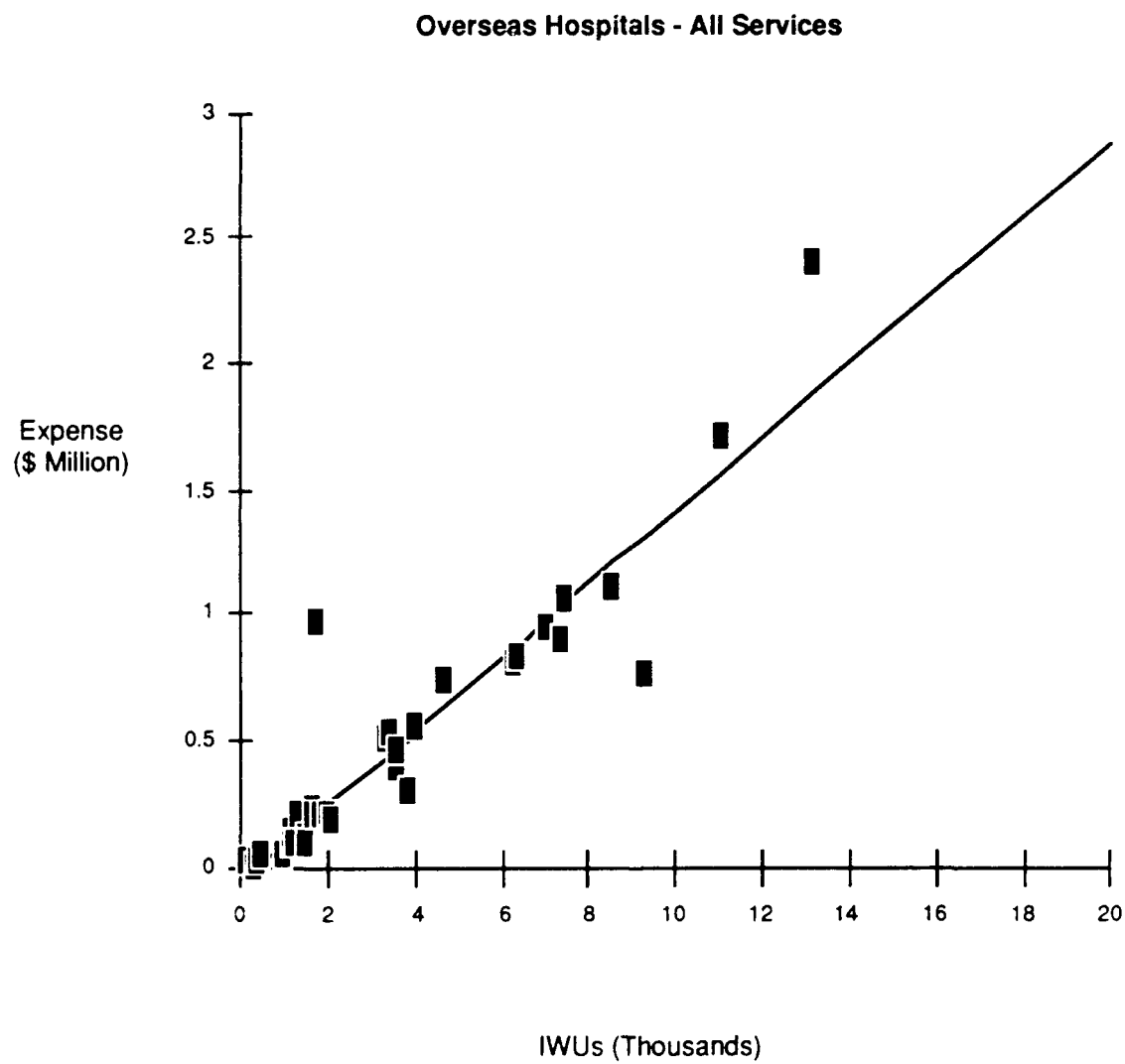


EXHIBIT3-6: SUMMARY OF SELECTED RESULTS FOR OVERSEAS HOSPITAL INPATIENT CLINICIAN
SALARY MODELS

Variables	Model					
	1	2	3	4	5	6+
Base (\$000)						
INTERCEPT	-26	-14	-43	-9	-8	
IWU	0.140 *	0.148 *	0.159 *	0.211	0.136 *	
IWU_O					0.082	
D_ARMY*IWU						0.146 *
D_NAVY*IWU						0.157 *
D_USAF*IWU						0.092 *
Percentage Adjustments						
D_NAVY		9.25	72.06 *	8.07	11.74	
D_USAF		-35.20 *	-25.08	-37.59 *	-35.31 *	
D_PACIFIC			-43.85 *			
AD_DISP%				-0.56		
OBG_DISP%				-0.39		
Standard Error of Estimate	3.621	3.392	3.094	3.494	3.440	3.345

*Statistically different from zero at P = .05 level of significance.

+Model 6 was chosen as the final model for application and further analysis.

section 2.4.1. Therefore, a model-by-model discussion will not be presented here. The final model selected is presented below.

FINAL OVERSEAS INPATIENT CLINICIAN MODEL

MODEL 6

D_ARMY*IWU	\$146
D_NAVY*IWU	\$157
D_USAF*IWU	\$ 92

4.0 REGRESSION ANALYSIS: AMBULATORY EXPENSES

This chapter presents a detailed discussion of ambulatory expense modeling. The fundamental measure of workload adopted in modeling ambulatory expenses is the Ambulatory Work Unit (AWU). A facility's AWUs are based upon its total number of MEPRS ambulatory visits (inpatient plus outpatient) within each clinical subaccount, multiplied by an AWU weight reflecting the average cost of an ambulatory visit within each subaccount. The weights are relative to the average cost of a disposition. AWU weights are identified at the three character Standard Account Code level for all B accounts.¹

Ambulatory expenses were computed for each MTF by summing total expenses (including stepped-down ancillary and support expenses) across MEPRS ambulatory workcenters. Ambulatory expenses and AWUs for each Service are presented in the table below.²

FY88 MEPRS AMBULATORY EXPENSES AND AWUs, BY SERVICE BRANCH
(Expenses in Thousands)

	<u>Expenses</u>		<u>AWUs</u>	
ARMY	\$975,353	37.5%	504,589	42.1%
NAVY	\$678,284	26.0%	258,736	21.6%
AIR FORCE	\$949,740	36.5%	435,755	36.3%
<u>TOTAL</u>	<u>\$2,603,375</u>	<u>100.0%</u>	<u>1,199,081</u>	<u>100.0%</u>

¹A complete discussion of AWU development is found in Military Health Services System Ambulatory Work Unit, US Army Health Care Studies and Clinical Investigation Activity, (April 1988), HR88-001.

² Expense and AWUs were adjusted to exclude Primus/NAVCARE (BHH) and Occupational Health (BHG). These clinics were removed to improve the linkage between MEPRS expenses and financial data sources as discussed in Chapter 6.0.

This chapter contains four sections. Section 4.1 provides the methodology and results of the medical center modeling. Sections 4.2, 4.3, and 4.4 provide the corresponding discussion for CONUS community hospitals, overseas hospitals, and clinics, respectively.

4.1 MEDICAL CENTER MODELING AND RESULTS

A scatter plot showing the relationship between ambulatory expenses and AWUs for each medical center is presented in exhibit 4-1. The solid line represents the line which best fits the data for all medical centers, in terms of minimizing the sum of the squares (across all facilities) of the difference between each facility's observed expenses and the level of expenses represented by the line. As illustrated in the scatter plot, there is a great deal of dispersion of facilities about the simple regression line. However, two facilities which stand out from the rest are NH Bethesda (\$53 million, 13,844 AWUs) and NH San Diego (\$50 million, 14,078 AWUs). These facilities have the second and fourth highest level of ambulatory expenses, but rank tenth and ninth, respectively, in terms of AWUs. These facilities were eventually eliminated from those used in estimating medical center ambulatory expense model parameters, as will be discussed below. Section 4.1.1 discusses the initial medical center ambulatory models. Section 4.1.2 presents the final medical center ambulatory model chosen for application and further analysis in chapter 5.0.

4.1.1 INITIAL MEDICAL CENTER MODELS

Selected models estimated for the medical center ambulatory expenses are presented below. The resultant model coefficients are presented in exhibit 4-2.

EXHIBIT 4-1: INITIAL SCATTER DIAGRAM OF MEDICAL CENTER
AMBULATORY EXPENSE

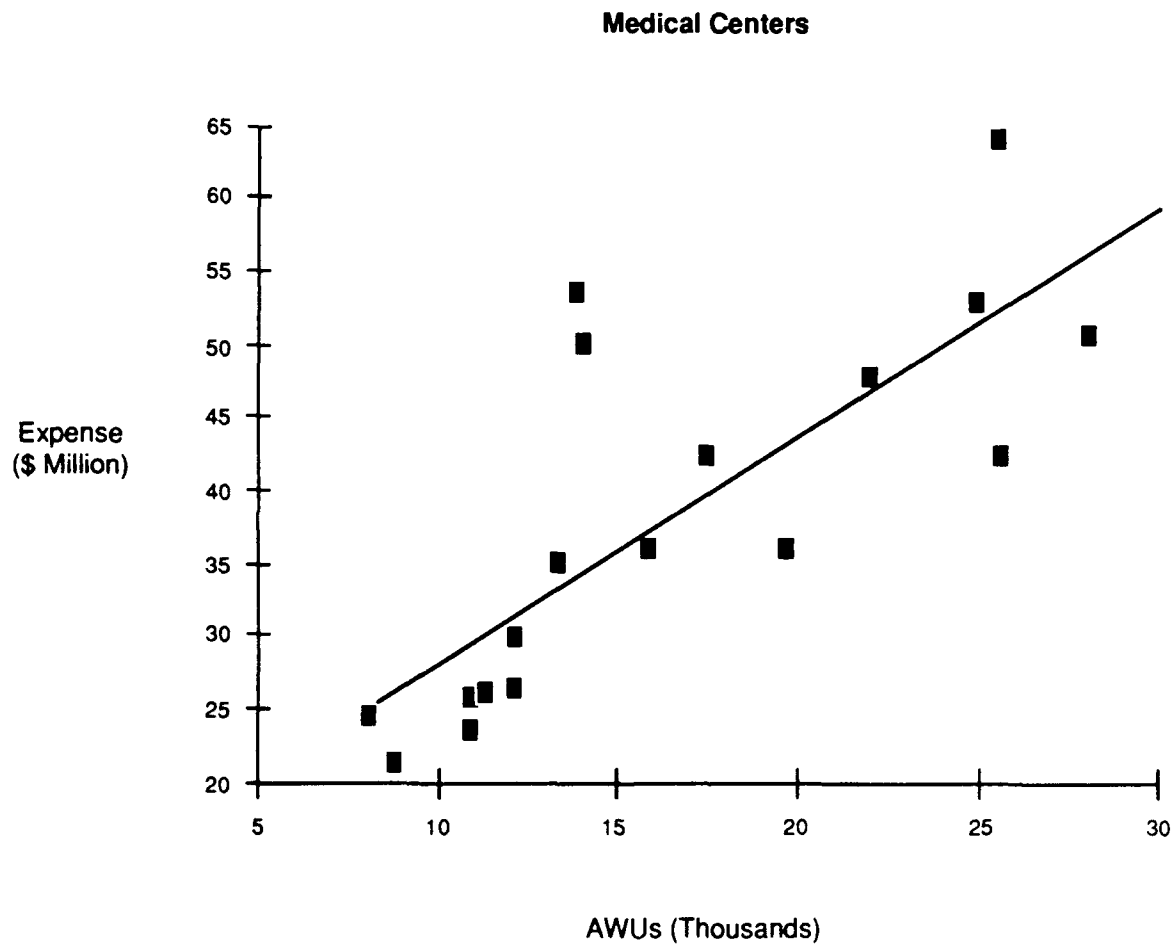


EXHIBIT 4-2: SUMMARY OF SELECTED RESULTS FOR MEDICAL CENTER AMBULATORY EXPENSE MODELS

Variables	Model			
	1	2	3	2a+
Base (\$000)				
INTERCEPT	10,405 *	1,115	3,111	3,996
AWU	1,695 *	1,965 *	1,571 *	1,825 *
GMEACT			32,427	
Percentage Adjustments				
D_NAVY		60.26 *	40.05 *	25.71
D_USAF		12.44	12.30	9.30
GME_95				1.42
Standard Error of Estimate	65.785	43.835	42.813	33.366

*Statistically different from zero at P = .05 level of significance.

+Model 2a was chosen as final model for application and further analysis.

Note: NH San Diego and NH Bethesda were eliminated from model 2a prior to parameter estimation.

SUMMARY OF MODEL FORMS: MEDICAL CENTER AMBULATORY EXPENSES

MODEL PARAMETRIC FORM

- | | |
|----|---|
| 1 | $B_0 + B_1 \cdot AWU$ |
| 2 | $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$ |
| 3 | $(B_0 + B_1 \cdot AWU + B_2 \cdot GMEACT) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$ |
| 4 | $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot GME_95)$ |
| 2a | $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$ |

Note: NH San Diego and NH Bethesda were eliminated from model 2a prior to parameter estimation.

The remainder of this section presents a discussion of these models and results.

Model 1

Form of model:

$$AMBEXP\$ = B_0 + B_1 \cdot AWU;$$

where:

AMBEXP\$ = ambulatory expenses; and

AWU = ambulatory work units.

This is the basic form of the model, consisting of an intercept term and the AWU variable. As indicated in the exhibit, both coefficients are statistically different from zero.

Model 2

Form of model:

$$AMBEXP\$ = (B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF).$$

The addition of the Service branch dummy variables reduced the intercept term from what it was in model 1. This was largely due to the fact that the Navy coefficient absorbed much of the effect of the NH San Diego and NH Bethesda outliers, allowing the intercept to drop. The 60.26 percent

Navy coefficient indicates that Navy facilities spent, on average, 60.26 percent more than Army facilities for any given AWU level. The 12.44 percent Air Force coefficient has a corresponding interpretation for Air Force facilities. While the Navy coefficient was statistically different from zero, the Air Force coefficient was not. Both variables were retained in the subsequent modeling, however, to allow development of Service branch specific models. In this case, the SEE is significantly less than that of model 1.

Model 3

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU} + B_2 \cdot \text{GMEACT}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF});$$

where:

GMEACT = total number of residents plus interns.

This model was the first of two attempts to determine whether GME affected the expense of ambulatory health care. The GMEACT coefficient of \$32,427 indicates the estimated expense associated with each resident or intern for the Army. The Navy and Air Force expense per resident would be equal to \$32,427, adjusted by the appropriate Service branch coefficient.

Note that the Navy coefficient has decreased sharply from what it was in model 2. This is due to the fact that the Navy medical centers, on average, had the most intense GME programs of the Services in terms of numbers of residents and interns per AWU. Therefore, the GME variable and the Navy dummy variable have some degree of colinearity, with the result that it is difficult to accurately distinguish the precise effect that each independent variable has upon the dependent variable. This implies, in turn, that introducing the GME variable into the model

would have a considerable effect upon the estimated Navy coefficient. In any case, the coefficient on GMEACT was not statistically different from zero, so this form of the model was not retained.

Model 4

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{GME_95});$$

where:

GME_95 was equal to ten times the number of residents plus interns, divided by (ADPL/.95).

This was the same formulation used in the inpatient expense models. It was used here as a test to determine whether this formulation of the model would help in explaining medical center ambulatory costs. As shown in exhibit 4-2, the coefficient on GME_95 was not statistically different from zero.

4.1.2 FINAL MEDICAL CENTER MODEL

As noted in the introduction to this section, NH Bethesda and NH San Diego appeared as outliers on the scatter plot. The Navy Service branch coefficients were large and statistically different from zero in all of the models tested, thus it does not appear that any of the forms tested have provided an explanation for the very different costs exhibited at these two facilities. Therefore, they were eliminated from the facilities being modeled and model 2 was estimated again. The results of this estimation are displayed in the table below.

FINAL MEDICAL CENTER AMBULATORY EXPENSE MODEL

MODEL 2a

<i>Base (\$000)</i>	
Intercept	3.996
IWU	1.825
<i>Percentage Adjustments</i>	
D_NAVY	25.71%
D_USAF	9.30%

Note: NH San Diego and NH Bethesda were eliminated from model 2a prior to parameter estimation.

4.2 CONUS COMMUNITY HOSPITAL MODELING AND RESULTS

A scatter plot showing the relationship between ambulatory expenses and AWUs for each CONUS community hospital is presented in exhibit 4-3. The solid line represents the line which best fits the data for all CONUS community hospitals, in terms of minimizing the sum of the squares (across all facilities) of the difference between each facility's observed expenses and the level of expenses represented by the line. Most of the larger facilities lie under this line, suggesting that there may be increasing returns to scale (this issue will be addressed in the modeling). The following section discusses initial CONUS community hospital ambulatory expense models and results. Section 4.2.2 presents the final model chosen for application and further analysis in chapter 5.0.

4.2.1 INITIAL CONUS COMMUNITY HOSPITAL MODELS

Selected parametric forms of the models estimated for the CONUS community hospital ambulatory expenses are presented below. Model results are illustrated in exhibit 4-4.

EXHIBIT 4-3: INITIAL SCATTER DIAGRAM OF CONUS COMMUNITY
HOSPITAL AMBULATORY EXPENSE

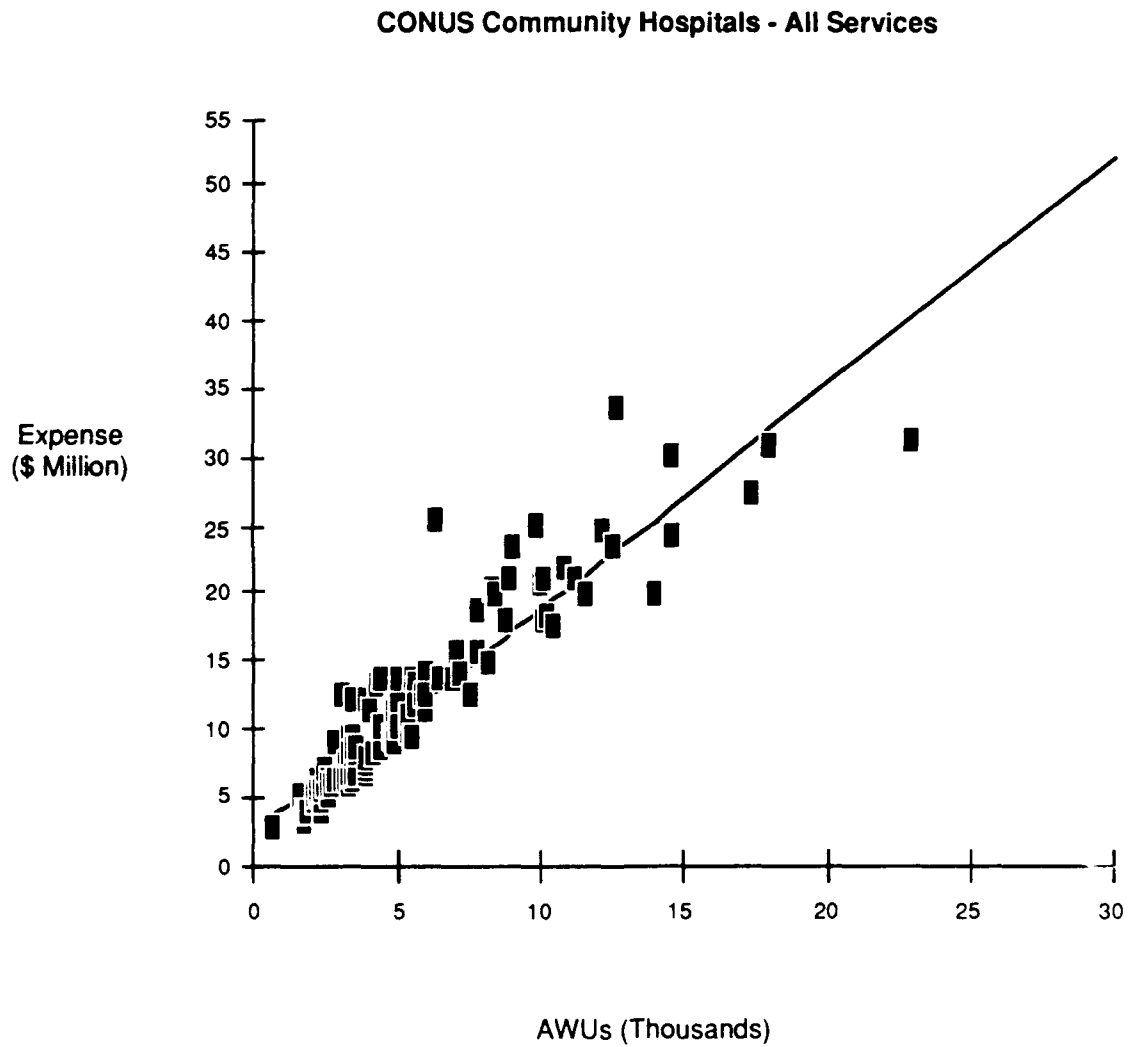


EXHIBIT 4-4: SUMMARY OF SELECTED RESULTS FOR CONUS COMMUNITY HOSPITAL
AMBULATORY EXPENSE MODELS

Variables	Model					
	1	2+	3	4	5	6
Base (\$000)						
INTERCEPT	1,378 *	857 *	913 *	1,251 *	1,086 *	-1
AWU	1,828 *	1,707 *	1,693 *	1,692 *	1,772 *	2,225 *
GMEACT			17,488			
AWU ²						-0.000036 *
Percentage Adjustments						
D_NAVY		36.71 *	35.75 *	35.74 *	35.19 *	31.14 *
D_USAF		10.78 *	10.56 *	7.24	22.59 *	3.93
D_REMOTE				-11.82 *		
D_TRAIN				0.39		
AD_VIS%					0.13	
OBG_VIS%					-1.77 *	
Standard Error of Estimate	31.763	26.071	26.162	25.654	24.770	24.628

*Statistically different from zero at P = .05 level of significance.

+Model 2 was chosen as final model for application and further analysis.

SUMMARY OF MODEL FORMS: CONUS COMMUNITY HOSPITAL AMBULATORY EXPENSES

MODEL PARAMETRIC FORM

- 1 $B_0 + B_1 \cdot AWU$
- 2 $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 3 $(B_0 + B_1 \cdot AWU + B_2 \cdot GMEACT) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 4 $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_REMOTE)$
 $\quad * (1 + C_4 \cdot D_TRAIN)$
- 5 $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot AD_VIS\%)$
 $\quad * (1 + C_4 \cdot OBG_VIS\%)$
- 6 $(B_0 + B_1 \cdot AWU + B_2 \cdot AWU^2) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$

The remainder of this section will discuss these models and results. Given that many of the models were similar to those estimated for medical centers, the discussion will not include those models whose form and interpretation have been discussed in earlier sections. With that in mind, the discussion below will focus upon models 4, 5, and 6.

Model 1

Form of Model:

$$AMBEXP\$ = B_0 + B_1 \cdot AWU.$$

The form and method for interpreting the basic model has been explained previously and will not be discussed here.

Model 2

Form of Model:

$$AMBEXP\$ = (B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF).$$

This form of the model, with Service branch adjustments, has been interpreted previously and will not be discussed further here.

Model 3

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU} + B_2 \cdot \text{GMEACT}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

The form of this model was analyzed for medical centers in the previous section, and its interpretation will not be further discussed here.

Model 4

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_4 \cdot \text{D_REMOTE}) * (1 + C_3 \cdot \text{D_TRAIN});$$

where:

D_REMOTE = 1 if the MTF was remote;
0 otherwise;

D_TRAIN = 1 if the facility was located on a training base; and
0 otherwise.

This version of the model was run in order to test whether remote facilities or those located on training bases experienced different costs in delivering health care than other MTFs. As noted previously, facilities were designated remote if there were less than 100 civilian hospital beds within 40 miles. A facility was designated as being on a training base if the base had basic training or Advanced Individual Training (AIT) or both. These bases would be characterized as having large numbers of young people for a short time, who might be expected to require more than average care. The values for each of these variables were based upon FY85 data. The results show that while the coefficient for D_REMOTE was statistically different from zero, that for D_TRAIN was not. The negative coefficient on D_REMOTE implies that remote facilities provided health care less expensively than other facilities. It is interesting to note that while the Navy coefficient was not affected

very much (in relation to its value in previous models), the Air Force coefficient is smaller, and no longer statistically different from zero.

Model 5

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{AD_VIS\%}) * (1 + C_4 \cdot \text{OBG_VIS\%});$$

where:

AD_VIS% = the percentage of visits which were by active duty beneficiaries; and

OBG_VIS% = the percentage of visits which were obstetrical or gynecological in nature.

This version of the model is the ambulatory version of model 4 in the inpatient nonclinician modeling, employing the proportions of visits which were by active duty beneficiaries or were ob/gyn in nature, rather than dispositions. While the active duty coefficient was not statistically different from zero, the ob/gyn coefficient was. Note the large jump in the value of the Air Force coefficient, relative to models 2 and 3. The Navy coefficient exhibited no large changes among these models. The Air Force had the largest amount of ob/gyn ambulatory work among the Services which accounts for this change. The ob/gyn coefficient implied that for every one percent increase in the percentage of visits that were ob/gyn related, a facility's expenses decreased by 1.77%.

Model 6

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU} + B_2 \cdot \text{AWU}^2) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

This form of the model corresponds to model 7 in the CONUS community hospital inpatient nonclinician modeling. Here, as in model 7, the estimated coefficient on the squared AWU term was negative and

statistically different from zero. In examining the scatter diagram for ambulatory expenses, one notes that Womack is the largest facility, and lies underneath the least squares regression line. Recall a similar result was presented in chapter 3.0 for inpatient expenses.

4.2.2 FINAL CONUS COMMUNITY HOSPITAL AMBULATORY EXPENSE MODEL

The model finally chosen for implementation for ambulatory expenses was model 2. In modeling ambulatory expenses, there were a number of variables that turned out to be statistically different from zero, and a number of models that had lower standard errors than model 2. However, while the more sophisticated models may be superior, more feedback from DoD and the Services was desired before actively studying implementation of these models. Therefore, as with earlier models, a more simple, straightforward model was chosen, which still allows separate Service branch specific models. The model results attained here will be considered when further modeling with more recent data is pursued. This will determine whether these results hold true over time.

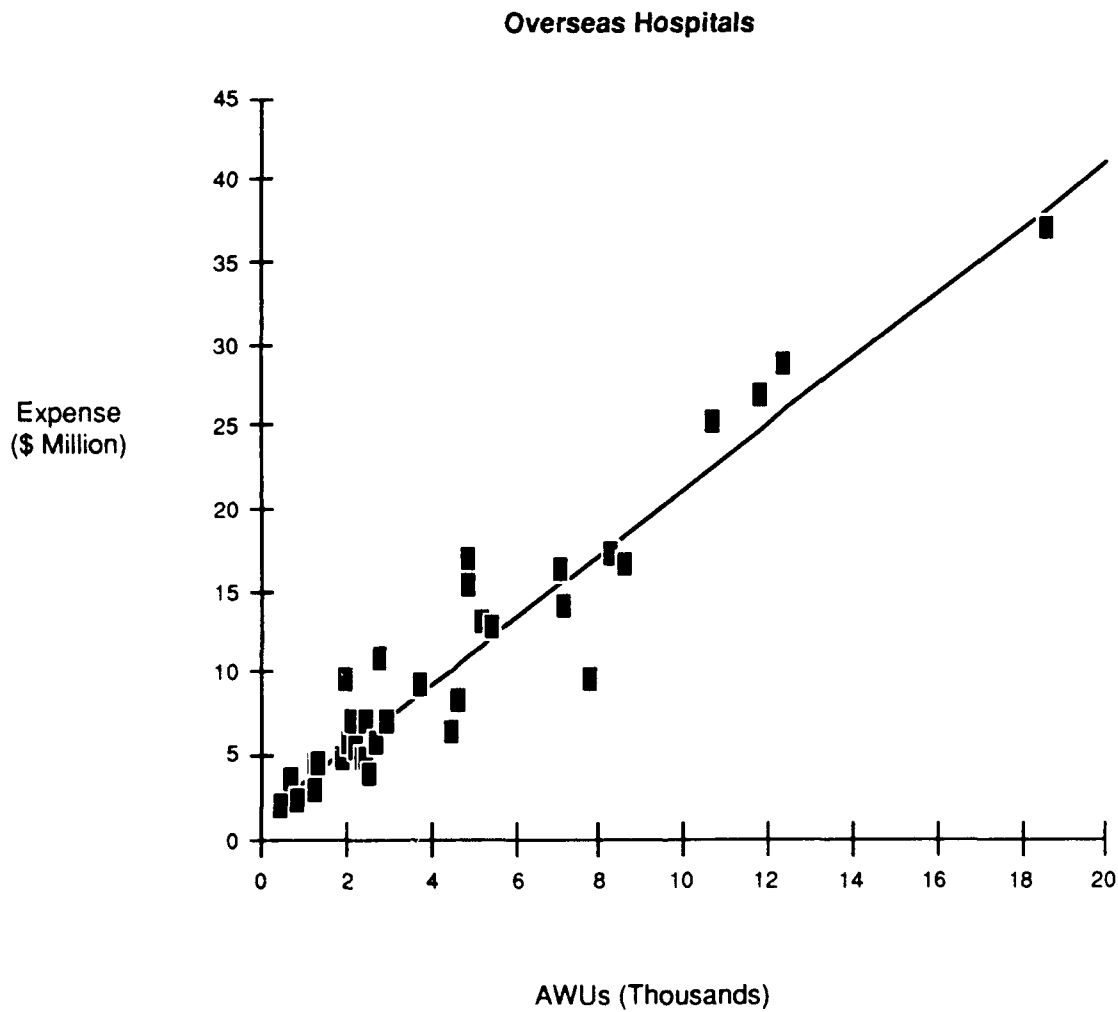
FINAL CONUS COMMUNITY HOSPITAL AMBULATORY MODEL

<u>MODEL 2</u>	
<i>Base (\$000)</i>	
Intercept	857
AWU	1.707
<i>Percentage</i>	
<i>Adjustments</i>	
D_NAVY	36.71%
D_USAF	10.78%

4.3 OVERSEAS HOSPITAL MODELING AND RESULTS

A scatter plot showing the relationship between ambulatory expenses and AWUs for each overseas hospital is presented in exhibit 4-5. The

EXHIBIT 4-5: INITIAL SCATTER DIAGRAM OF OVERSEAS
HOSPITAL AMBULATORY EXPENSE



solid line represents the line which best fits the data for all overseas hospitals, in terms of minimizing the sum of the squares (across all facilities) of the difference between each facility's observed expenses and the level of expenses represented by the line. The table below summarizes the parametric forms for all overseas ambulatory expense models.

SUMMARY OF MODEL FORMS: OVERSEAS AMBULATORY EXPENSES

MODEL PARAMETRIC FORM

- | | |
|---|---|
| 1 | $B_0 + B_1 \cdot AWU$ |
| 2 | $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$ |
| 3 | $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_PACIFIC)$ |
| 4 | $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot AD_VIS\%)$
$\quad * (1 + C_4 \cdot OBG_VIS\%)$ |

Selected models estimated for the overseas hospital ambulatory expenses are presented in exhibit 4-6. The remainder of this section discusses these models and results. The variables included in these models and the interpretation of their coefficients have already been covered in the ambulatory modeling discussion above, as well as in the overseas hospital inpatient nonclinician expense modeling discussion in section 2.4.1. Therefore, a model-by-model discussion will not be presented.

In all of the models, the intercept and AWU coefficients were statistically different from zero. Adding Service branch dummy variables reduced the SEE, although neither Service branch coefficient was statistically different from zero. Adding the DoD Pacific region dummy variable resulted in a slightly lower SEE, although the coefficient on this variable was not statistically different from zero. While the Pacific dummy variable was not retained for the final model, the Service branch variables were, because maintaining these variables allowed the development of Service specific models. Therefore the final overseas ambulatory expense model was model 2.

EXHIBIT 4-6: SUMMARY OF SELECTED RESULTS FOR OVERSEAS HOSPITAL AMBULATORY
EXPENSE MODELS

Variables	Model			
	1	2+	3	4
Base (\$000)				
INTERCEPT	1,346 *	1,884 *	2,234 *	1,235 *
AWU	1,999 *	1,951 *	1,879 *	1,296 *
Percentage Adjustments				
D_NAVY		13.80	3.34	8.52
D_USAF		-19.10	-25.12 *	-27.38 *
D_PACIFIC			13.81	
AD_VIS%				0.63
OBG_VIS%				2.90
Standard Error of Estimate	38.614	34.948	34.539	33.390

*Statistically different from zero at P = .05 level of significance.

+Model 2 was chosen as final model for application and further analysis.

FINAL OVERSEAS HOSPITAL AMBULATORY MODEL

MODEL 2

<i>Base (\$000)</i>	
Intercept	1,884
AWU	1.951
<i>Percentage Adjustments</i>	
D_NAVY	13.8%
D_USAF	-19.1%

4.4 CLINIC MODELING AND RESULTS

This section presents the model forms and results involved in the medical clinic modeling. Medical clinics do not provide inpatient workload and therefore, were not included in the previous chapters on inpatient expense modeling. There are two further subsections. Section 4.4.1 discusses selected forms and results for clinic modeling. Section 4.4.2 presents the final FY88 clinic model.

4.4.1 INITIAL CLINIC AMBULATORY EXPENSE MODELS

A scatter plot showing the relationship between ambulatory expenses and AWUs for each clinic is presented in exhibit 4-7. The solid line represents the line which best fits the data for all clinics, in terms of minimizing the sum of the squares (across all facilities) of the difference between each facility's observed expenses and the level of expenses represented by the line. Two facilities are individually identified in the diagram: NMCL San Diego and USAF Clinic Peterson. As will be discussed below, these MTFs were eventually excluded from the final model because their costs were atypical, relative to their AWUs, with respect to those of other clinics. The table below summarizes selected parametric forms of the clinic ambulatory models. The resultant model coefficients are presented in exhibit 4-8.

EXHIBIT 4-7: INITIAL SCATTER DIAGRAM OF CLINIC AMBULATORY EXPENSE

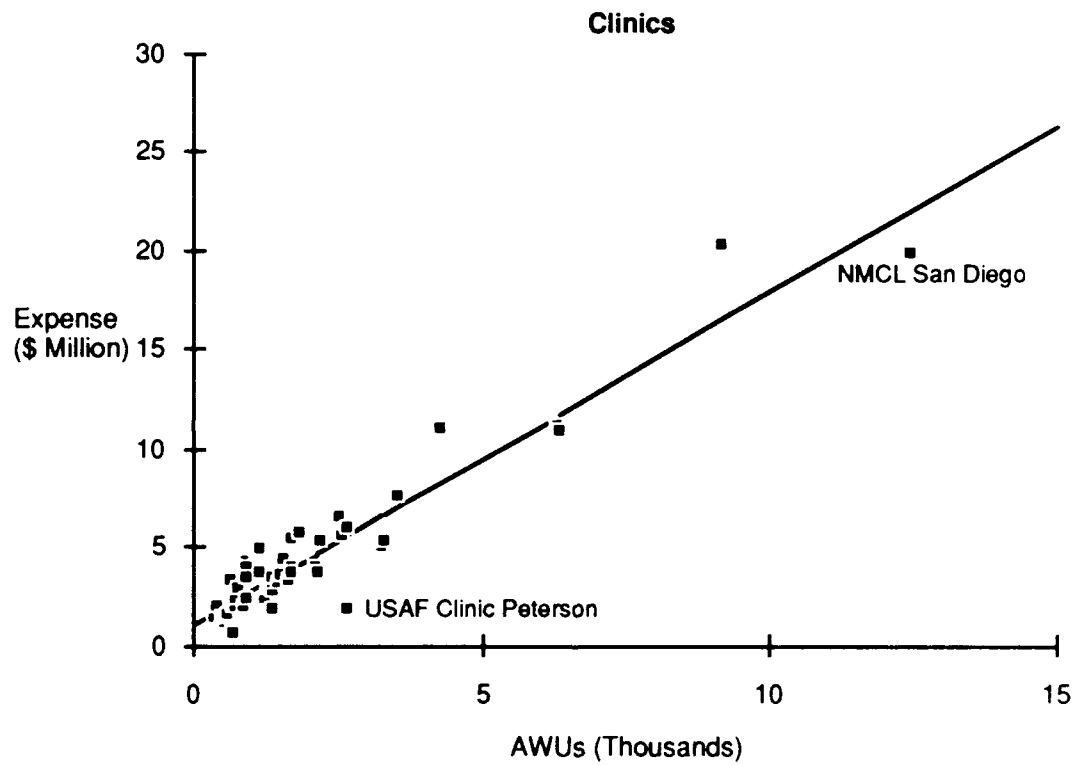


EXHIBIT 4-8: SUMMARY OF SELECTED RESULTS FOR CLINIC AMBULATORY
EXPENSE MODELS

Variables	Model				
	1	2	3	4	4a
Base (\$000)					
INTERCEPT	929 *	1,754 *	2,271 *	1,273 *	1,138 *
AWU	1,738 *	1,714 *	1,710 *	2,147 *	2,247 *
AWU ²				-0.000068 *	-0.000079
Percentage Adjustments					
D_NAVY		4.19	-1.69	12.36	12.83
D_USAF		-29.51 *	-27.85 *	-27.09 *	-25.86 *
D_OSEAS			-24.10 *		-24.64 *
Standard Error of Estimate	28.194	23.782	21.715	22.553	21.341

*Statistically different from zero at P = .05 level of significance.

+Model 2 was chosen as final model for application and further analysis.

Note: NMCL San Diego and USAF Clinic Peterson were eliminated from models 2a and 4a prior to parameter estimation.

SUMMARY OF MODEL FORMS: CLINIC AMBULATORY MODEL

MODEL PARAMETRIC FORM

- 1 $B_0 + B_1 \cdot AWU$
- 2 $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 3 $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF) * (1 + C_3 \cdot D_OSEAS)$
- 4 $(B_0 + B_1 \cdot AWU + B_2 \cdot AWU^2) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 2a $(B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$
- 4a $(B_0 + B_1 \cdot AWU + B_2 \cdot AWU^2) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF)$

Note: NMCL San Diego and USAF Clinic Peterson were eliminated from models 2a and 4a prior to parameter estimation.

The remainder of this section presents a discussion of these models and results.

Model 1

Form of model:

$$AMBEXP\$ = B_0 + B_1 \cdot AWU.$$

This is the basic form of the model, consisting of an intercept term and the AWU variable. As indicated in the exhibit, both coefficients are statistically different from zero.

Model 2

Form of model:

$$AMBEXP\$ = (B_0 + B_1 \cdot AWU) * (1 + C_1 \cdot D_NAVY) * (1 + C_2 \cdot D_USAF).$$

The addition of a Service branch adjustment increased the estimated intercept and lowered the estimated marginal cost per AWU slightly. As shown in the exhibit, the Air Force coefficient was statistically significantly different from zero, while the Navy coefficient was not.

Model 3

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}) * (1 + C_3 \cdot \text{D_OSEAS});$$

where:

$$\text{D_OSEAS} = 1 \text{ if clinic was located overseas (including Alaska or Hawaii); and} \\ 0 \text{ otherwise.}$$

The inclusion of an adjustment for overseas facilities resulted in an increased intercept term and a slightly decreased marginal cost per AWU, relative to model 2. The overseas coefficient itself was statistically different from zero, and negative.

Model 4

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU}^2) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

This model was prompted by the observation that in addition to the fact that the largest facility, NMCL San Diego, was under the projection line, several of the smaller facilities were above this line. This suggested that a curved line might perform better than a straight line, in terms of fitting the data. As displayed in the exhibit, the estimated coefficient on the AWU^2 term is statistically different from zero. However, there was some concern that NMCL San Diego exerted undue influence in this regression, and another regression was estimated with this facility removed. The results of this regression will be discussed under model 4a, below.

4.4.2 FINAL CLINIC AMBULATORY EXPENSE MODEL

As already mentioned, there was some concern about the amount of influence that NMCL San Diego and USAF Clinic Peterson were exerting

upon the results of the models. Therefore, these two MTFs were deleted from the data used in modeling, and two of the previous models (model 4 and model 2) were re-estimated. This section discusses the results of these two models.

Model 4a

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU} + B_2 \cdot \text{AWU}^2) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

This form of the model is identical to that of model 4, but NMCL San Diego and USAF Clinic Peterson were deleted. The most interesting comparison to model 4 results is that the estimated coefficient on the AWU^2 term, while negative and greater in magnitude in model 4a than in model 4, was no longer statistically different from zero. This result indicates that the two clinics excluded from the model estimation (most notably NMCL San Diego) were probably exerting undue influence upon the regression results in model 4, causing the coefficient on AWU^2 to be statistically different from zero.

Model 2a

Form of model:

$$\text{AMBEXP\$} = (B_0 + B_1 \cdot \text{AWU}) * (1 + C_1 \cdot \text{D_NAVY}) * (1 + C_2 \cdot \text{D_USAF}).$$

Because the AWU^2 coefficient in model 4a was not statistically different from zero, model 2a was the form of the model adopted as the final model. With NMCL San Diego and USAF Clinic Peterson excluded from the modeling, the estimated intercept decreased and the estimated marginal cost per AWU increased. Both the estimated Navy and Air Force coefficients increased (in the case of the Air Force, became less negative). These results are not surprising, because both excluded clinics were

below the regression line in exhibit 4-7, indicating that they would have a dampening influence on the estimated AWU coefficients and on those for their respective Services. The coefficients for this model are presented below.

FINAL CLINIC AMBULATORY MODEL

MODEL 2a

<i>Base (\$000)</i>	
Intercept	1.508
IWU	1.838
<i>Percentage</i>	
<i>Adjustments</i>	
D_NAVY	6.94%
D_USAF	-25.86%

5.0 EVALUATION OF MODELING RESULTS

This chapter provides an evaluation and summary of the modeling results for inpatient nonclinician, inpatient clinician, and ambulatory expenses. To evaluate the models, FY88 and FY89 workload and Graduate Medical Education (GME) data were used to estimate FY88 and FY89 inpatient and ambulatory expenses. The selected model parameters described in the previous chapters were employed to estimate both FY88 and FY89 expenses. These estimated expenses were then compared to observed FY88 and FY89 inpatient clinician, nonclinician, and ambulatory expenses at the facility level. Expense data were obtained from summaries of MEPRS accounts available from the Defense Medical Information System (DMIS). Comparisons were based upon unadjusted data; that is, there were no adjustments made for inflation, changes in operating procedures and policies, or other factors that might influence the cost of providing care from one year to the next.

This chapter consists of four sections that parallel the model presentation in the previous chapters. Each section provides an overview as well as the MTF level results for the respective models. Section 5.1 presents medical center models, section 5.2 discusses CONUS community hospital models, section 5.3 evaluates overseas hospital models, and section 5.4 presents clinic models. Sections 5.1 through 5.3 are each divided into three subsections: a discussion of inpatient nonclinician expenses, inpatient clinician expenses, and ambulatory expenses. Estimated and observed expenses are presented for each modeled MTF as well as a comparison of observed costs per work unit for FY88 and FY89. A comparison of observed costs facilitates identifying MTFs with potential data problems and conveniently displays the changes in costs for providing care at each MTF from FY88 to FY89. Note,

expenses and workload within the PRIMUS/NAVCARE and Occupational Health subaccounts were excluded prior to development and analysis of the ambulatory expense models. The remainder of this section provides an overview and interpretation of the evaluation results.

Overview of Model Evaluation

The selected models presented in the previous chapters were applied to FY88 and FY89 MEPRS data to examine the predictive performance of the respective models. Performance was examined with respect to two dimensions. First, the degree to which the predicted expense approximated the observed expense in a given year was quantified. An error bound of 25 percent was used to illustrate those MTFs that have predicted expenses that differ considerably from observed expenses.¹ The number of MTFs that differed by greater than 25 percent was computed for each model in FY88 and compared to the count for FY89. This comparison provides a view of the relative stability of the models, i.e., whether or not the predictive power of the selected models vary considerably from year to year.

In reviewing the evaluation results, it is important to note that some deviations from the predicted values are expected unless the predicted models have been constructed to precisely duplicate historical results. However, the rationale for such an approach would be questionable. If values that exactly equalled historical data were the outcome of the models, resource allocation based upon these models for a given level of workload would be exactly as observed in the past. In contrast, the selected models assume that the predicted expenses are appropriately weighted considering the factors taken into account by

¹The error bound of 25% is used as a simple mechanism to identify outliers; it is straightforward to interpret and is not meant to imply statistical significance.

each model. As a result, those MTFs that are more efficient than average for a given case-mix within a given peer group are rewarded and those that are less efficient are not. With this concept in mind, deviations from observed values were examined to establish whether any biases might exist with respect to peer grouping or fiscal year.

Exhibit 5-1 shows the number of hospitals that have greater than 25 percent differences between observed and estimated expenses for each model. The exhibit illustrates counts of facilities for which the respective ratio of predicted to observed expense is less than 0.75 or greater than 1.25. In addition, a comparison of total estimated inpatient and outpatient expenses (computed by summing the estimates from each model for each facility) to total observed expenses is presented. Thus, if the separate models underestimated inpatient expenses and overestimated ambulatory expenses, the result may be an accurate estimate of total expenses. Note, since clinician salaries are a small component of total expenses (typically less than 5 percent), the fact that these expenses are not accurately estimated has little influence on the accuracy of the estimate of total expenses. It can be seen from exhibit 5-1 that only 19 of 162 hospitals in FY88 and 20 of 161 hospitals in FY89 have a difference between modeled and observed total expenses greater than 25 percent.

Over all hospitals, there were fewer MTFs with significant error in estimates of total expenses than any of the three components of total expenses. Thus, there appears to be a tendency to overestimate one component of total expense while underestimating another component. This error will then be compensated for when the components are summed. A possible explanation for this tendency is that facilities may be assigning expenses between inpatient and outpatient accounts that do not fully reflect incurred expenses. For example, if administrative

**EXHIBIT 5-1: SUMMARY COUNTS OF HOSPITALS WITH MODELED TO
OBSERVED EXPENSE RATIOS < 0.75 OR > 1.25**

MEDICAL CENTER EXPENSE MODELS								
	<u>ARMY</u>		<u>NAVY</u>		<u>USAF</u>		<u>ALL SERVICES</u>	
	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>
NONCLINICIAN EXPENSES	0	0	0	1	0	0	0	1
CLINICIAN EXPENSES	0	2	2	3	0	1	2	6
AMBULATORY EXPENSES	0	0	2	2	0	0	2	2
TOTAL EXPENSES*	0	0	0	0	0	0	0	0
FACILITIES ESTIMATED**	7	7	4	4	7	7	18	18
CONUS COMMUNITY HOSPITAL MODELS								
NONCLINICIAN EXPENSES	5	7	5	5	9	9	19	21
CLINICIAN EXPENSES	9	12	15	15	17	14	41	41
AMBULATORY EXPENSES	2	3	7	9	5	5	14	17
TOTAL EXPENSES*	2	3	6	7	4	4	12	14
FACILITIES ESTIMATED**	29	29	21	21	60	59	110	109
OVERSEAS HOSPITAL MODELS								
NONCLINICIAN EXPENSES	2	3	2	1	5	5	9	9
CLINICIAN EXPENSES	2	3	4	6	8	8	14	17
AMBULATORY EXPENSES	2	1	2	0	5	6	9	7
TOTAL EXPENSES*	2	1	1	1	4	4	7	6
FACILITIES ESTIMATED**	11	11	8	8	15	15	34	34
SUM OVER ALL HOSPITAL MODELS								
NONCLINICIAN EXPENSES	7	10	7	7	14	14	28	31
CLINICIAN EXPENSES	11	17	21	24	25	23	57	64
AMBULATORY EXPENSES	4	4	11	11	10	11	25	26
TOTAL EXPENSES*	4	4	7	8	8	8	19	20
FACILITIES ESTIMATED**	47	47	33	33	82	81	162	161

*The Modeled to Observed Expense Ratio for Total Expenses is the ratio of the sum of the modeled expenses for each model component (nonclinician, clinician, and ambulatory expenses) to the sum of the observed expenses within each component.

**This is the number of facilities for which modeled and observed expenses were compared.

expenses are disproportionately assigned to inpatient accounts, then inpatient care expenses may be underestimated while outpatient expenses are overestimated. However, total expenses may be properly estimated in this example.

Exhibits 5-2 and 5-3 provide additional detail for those hospitals with the greatest deviations relative to observed expenses. Exhibit 5-2 provides a subset of exhibit 5-1, showing only the counts of MTFs with a ratio of predicted to observed expenses greater than 1.25, while exhibit 5-3 presents the same information for hospitals that had ratios less than 0.75. A comparison of these two exhibits reveals that the Army has approximately the same number of hospitals deviating on the high side as the low side. This appears to be generally true for each of the model types and peer groups. In contrast, the Navy and Air Force counts appear to be somewhat more heavily clustered in the 1.25 or greater ratio category. This finding indicates that additional testing is warranted to assess whether or not these observations are significant as the models are updated with FY89 and FY90 data. A similar evaluation of the clinic models is presented in section 5.4.

5.1 MEDICAL CENTERS

This section provides a detailed presentation of estimates obtained from medical center expense models. It consists of three subsections: Inpatient Nonclinician Expenses, Inpatient Clinician Expenses, and Ambulatory Expenses.

Inpatient Nonclinician Expenses

Exhibit 5-4 shows inpatient nonclinician expenses for Army, Navy, and USAF medical centers. As noted in Chapter 2, Walter Reed AMC Washington (DMIS ID 37) and Wilford Hall USAF Medical Center-Lackland

**EXHIBIT 5-2: SUMMARY COUNTS OF HOSPITALS WITH MODELED TO
OBSERVED EXPENSE RATIOS > 1.25**

MEDICAL CENTER EXPENSE MODELS								
	<u>ARMY</u>		<u>NAVY</u>		<u>USAF</u>		<u>ALL SERVICES</u>	
	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>
NONCLINICIAN EXPENSES	0	0	0	1	0	0	0	1
CLINICIAN EXPENSES	0	0	0	0	0	1	0	1
AMBULATORY EXPENSES	0	0	0	0	0	0	0	0
TOTAL EXPENSES*	0	0	0	0	0	0	0	0
FACILITIES ESTIMATED**	7	7	4	4	7	7	18	18
CONUS COMMUNITY HOSPITAL MODELS								
NONCLINICIAN EXPENSES	3	3	3	3	7	5	13	11
CLINICIAN EXPENSES	5	6	12	9	11	10	28	25
AMBULATORY EXPENSES	1	1	5	5	3	3	9	9
TOTAL EXPENSES*	1	1	4	3	2	3	7	7
FACILITIES ESTIMATED**	29	29	21	21	60	59	110	109
OVERSEAS HOSPITAL MODELS								
NONCLINICIAN EXPENSES	1	0	1	1	4	3	6	4
CLINICIAN EXPENSES	2	3	3	5	7	5	12	13
AMBULATORY EXPENSES	1	0	2	0	4	4	7	4
TOTAL EXPENSES*	1	0	1	1	4	3	6	4
FACILITIES ESTIMATED**	11	11	8	8	15	15	34	34
SUM OVER ALL HOSPITAL MODELS								
NONCLINICIAN EXPENSES	4	3	4	5	11	8	19	16
CLINICIAN EXPENSES	7	9	15	14	18	16	40	39
AMBULATORY EXPENSES	2	1	7	5	7	7	16	13
TOTAL EXPENSES*	2	1	5	4	6	6	13	11
FACILITIES ESTIMATED**	47	47	33	33	82	81	162	161

*The Modeled to Observed Expense Ratio for Total Expenses is the ratio of the sum of the modeled expenses for each model component (nonclinician, clinician, and ambulatory expenses) to the sum of the observed expenses within each component.

**This is the number of facilities for which modeled and observed expenses were compared.

**EXHIBIT 5-3: SUMMARY COUNTS OF HOSPITALS WITH MODELED TO
OBSERVED EXPENSE RATIOS < 0.75**

MEDICAL CENTER EXPENSE MODELS								
	<u>ARMY</u>		<u>NAVY</u>		<u>USAF</u>		<u>ALL SERVICES</u>	
	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>
NONCLINICIAN EXPENSES	0	0	0	0	0	0	0	0
CLINICIAN EXPENSES	0	2	2	3	0	0	2	5
AMBULATORY EXPENSES	0	0	2	2	0	0	2	2
TOTAL EXPENSES*	0	0	0	0	0	0	0	0
FACILITIES ESTIMATED**	7	7	4	4	7	7	18	18
CONUS COMMUNITY HOSPITAL MODELS								
NONCLINICIAN EXPENSES	2	4	2	2	2	4	6	10
CLINICIAN EXPENSES	4	6	3	6	6	4	13	16
AMBULATORY EXPENSES	1	2	2	4	2	2	5	8
TOTAL EXPENSES*	1	2	2	4	2	1	5	7
FACILITIES ESTIMATED**	29	29	21	21	59	59	109	109
OVERSEAS HOSPITAL MODELS								
NONCLINICIAN EXPENSES	1	3	1	0	1	2	3	5
CLINICIAN EXPENSES	0	0	1	1	1	3	2	4
AMBULATORY EXPENSES	1	1	0	0	1	2	2	3
TOTAL EXPENSES*	1	1	0	0	0	1	1	2
FACILITIES ESTIMATED**	11	11	8	8	15	15	34	34
SUM OVER ALL HOSPITAL MODELS								
NONCLINICIAN EXPENSES	3	7	3	2	3	6	9	15
CLINICIAN EXPENSES	4	8	6	10	7	7	17	25
AMBULATORY EXPENSES	2	3	4	6	3	4	9	13
TOTAL EXPENSES*	2	3	2	4	2	2	6	9
FACILITIES ESTIMATED**	47	47	33	33	81	81	161	161

*The Modeled to Observed Expense Ratio for Total Expenses is the ratio of the sum of the modeled expenses for each model component (nonclinician, clinician, and ambulatory expenses) to the sum of the observed expenses within each component.

**This is the number of facilities for which modeled and observed expenses were compared.

EXHIBIT 5-4: MODELED AND OBSERVED MEDICAL CENTERS NONCLINICIAN EXPENSES

DMIS ID	FACILITY	FY88 IWU%	FY88 MODELED NONCLINICIAN EXPENSES	FY88 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY89 IWU%	FY89 MODELED NONCLINICIAN EXPENSES	FY89 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWU	FY89 OBSERVED EXPENSE/IWU	RATIO
22	LETTERMAN AMC-PRESIDIO OF SF	19,988	\$47,458,916	\$45,137,061	1.05	17,283	\$41,417,149	\$46,311,036	0.89	\$2,257	\$2,680	1.19
31	FITZSIMONS AMC-DENVER	25,578	\$55,798,835	\$60,482,015	0.92	23,151	\$50,766,957	\$65,048,497	0.78	\$2,365	\$2,810	1.19
37	WALTER REED AMC-WASHINGTON	43,870	\$87,448,938	\$112,579,683	0.87	43,237	\$88,083,766	\$108,278,859	0.89	\$2,566	\$2,504	0.98
47	EISENHOWER AMC-FT GORDON	20,452	\$43,899,022	\$42,633,333	1.03	21,074	\$45,153,454	\$45,583,118	0.99	\$2,085	\$2,183	1.04
52	TRIPLER AMC-FT SHAFTER	28,896	\$62,238,084	\$71,710,745	0.87	28,354	\$61,141,810	\$69,612,349	0.88	\$2,483	\$2,455	0.99
108	WILLIAM BEAUMONT AMC-FT BLISS	24,913	\$53,082,088	\$49,822,373	1.08	23,753	\$60,734,397	\$53,451,089	0.95	\$2,004	\$2,250	1.12
125	MADIGAN AMC-FT LEWIS	25,256	\$57,323,623	\$49,602,837	1.16	25,442	\$57,724,895	\$50,212,230	1.15	\$1,964	\$1,974	1.00
	ARMY MEDICAL CENTERS	188,948	\$417,247,514	\$432,088,027	0.97	182,294	\$403,022,428	\$438,497,156	0.92	\$2,287	\$2,405	1.05
27	NH OAKLAND	14,280	\$34,488,328	\$35,082,976	0.98	13,475	\$32,689,100	\$39,148,674	0.83	\$2,457	\$2,905	1.18
28	NH SAN DIEGO	27,454	\$66,484,934	\$69,192,720	0.96	29,828	\$71,949,581	\$75,283,818	0.96	\$2,520	\$2,523	1.00
67	NH BETHESDA	22,553	\$51,693,677	\$42,390,094	1.22	23,789	\$54,370,628	\$42,070,002	1.29	\$1,880	\$1,768	0.94
124	NH PORTSMOUTH	28,978	\$83,879,882	\$69,949,460	0.91	27,634	\$81,045,551	\$70,147,981	0.87	\$2,414	\$2,538	1.05
	NAVY MEDICAL CENTERS	93,265	\$216,506,619	\$216,615,250	1.00	94,726	\$220,054,858	\$228,630,475	0.97	\$2,323	\$2,392	1.03
14	DAVID GRANT MED CTR-TRAVIS	15,668	\$34,807,653	\$30,495,179	1.14	13,967	\$31,321,352	\$36,284,627	0.86	\$1,946	\$2,598	1.33
56	USAF MED CTR SCOTT	9,047	\$19,041,276	\$19,796,407	0.96	7,635	\$16,446,574	\$18,595,261	0.88	\$2,188	\$2,436	1.11
68	MALCOM GROW MED CTR-ANDREWS	13,250	\$26,280,318	\$25,177,722	1.04	11,920	\$23,862,361	\$28,781,860	0.83	\$1,900	\$2,415	1.27
73	USAF MED CTR KEESLER	17,196	\$38,538,842	\$37,728,408	0.97	17,218	\$38,585,245	\$42,868,935	0.85	\$2,194	\$2,492	1.14
96	USAF MED CTR WRIGHT-PATTERSON	11,079	\$26,003,155	\$30,289,303	0.86	11,350	\$26,571,725	\$32,905,009	0.81	\$2,732	\$2,899	1.06
109	BROOKE AMC (JMAC)-FT SAM HOUSTON	32,938	\$71,437,270	\$70,547,825	1.01	31,587	\$68,619,655	\$69,478,449	0.99	\$2,142	\$2,200	1.03
117	WILFORD HALL MED CTR-LACKLAND	42,720	\$88,459,315	\$110,170,590	0.81	42,140	\$88,281,018	\$107,649,580	0.82	\$2,579	\$2,555	0.99
	USAF MEDICAL CENTERS	141,887	\$303,548,830	\$324,185,432	0.94	135,817	\$291,487,929	\$338,594,721	0.87	\$2,285	\$2,478	1.08

(DMIS ID 117), were excluded from the modeling process prior to development of the model parameters. The exhibit illustrates that in FY88, all facilities had less than a 25 percent difference between observed and estimated nonclinician expenses. In FY89, NH Bethesda had estimated expenses which were nearly 30 percent greater than observed expenses. Interestingly, clinician expenses for NH Bethesda were underestimated which may mean a portion of the facility's nonclinician expenses were reported under clinician accounts.

The exhibit also demonstrates that inpatient nonclinician costs per IWU are relatively stable between FY88 and FY89 with only two facilities reporting more than a 20 percent change in costs per IWU. Overall, the Air Force had an increase in expenses per IWU of 8 percent, while the Army and Navy had increases of 5 percent and 3 percent, respectively. As a result, the FY88-based model estimates expenses for both FY88 and FY89 with relative accuracy.

Inpatient Clinician Expenses

In computing the model parameter estimates for inpatient clinician expenses, NH Bethesda and NH San Diego were excluded from the modeling process. As displayed in exhibit 5-5, all modeled facilities had FY88 estimated expenses within 20 percent of observed expenses except NH Oakland (DMIS ID 27) and Eisenhower AMC-Fort Gordon (DMIS ID 47). NH Oakland is the only modeled facility with a difference greater than 20 percent in both FY88 and FY89. Additionally, 4 facilities reported more than 20 percent increases in clinician expenses per IWU and Brooke AMC (DMIS ID 109) reported a 22 percent decrease in expenses per IWU. Overall, the average ratio of modeled to observed expenses was relatively constant for the Navy and Air Force, but the Army dropped considerably. This is related to an underlying change in the observed cost per IWU.

EXHIBIT 5-5: MODELED AND OBSERVED MEDICAL CENTERS CLINICIAN EXPENSES

DMIS ID	FACILITY	FY88 IWUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 IWUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWU	FY89 OBSERVED EXPENSE/IWU	RATIO
22	LETTERMAN AMC-PRESIDIO OF SF	19,996	\$2,856,469	\$3,089,427	0.92	17,283	\$2,468,911	\$3,896,382	0.63	\$155	\$225	1.46
31	FITZSIMONS AMC-DENVER	25,578	\$3,653,583	\$3,216,489	1.14	23,151	\$3,307,167	\$4,067,937	0.81	\$126	\$176	1.40
37	WALTER REED AMC-WASHINGTON	43,870	\$6,266,917	\$6,442,722	0.97	43,237	\$6,176,492	\$9,647,603	0.64	\$147	\$223	1.52
47	EISENHOWER AMC-FT GORDON	20,452	\$2,921,609	\$2,412,268	1.21	21,074	\$3,010,463	\$2,520,034	1.19	\$118	\$120	1.01
52	TRIPLER AMC-FT SHAFTER	28,885	\$4,128,280	\$4,052,491	1.02	28,354	\$4,050,426	\$4,056,301	1.00	\$140	\$143	1.02
108	WILLIAM BEAUMONT AMC-FT BLISS	24,913	\$3,558,872	\$3,782,125	0.94	23,753	\$3,393,164	\$4,064,892	0.83	\$152	\$171	1.13
125	MADIGAN AMC-FT LEWIS	25,258	\$3,807,870	\$3,996,242	0.90	25,442	\$3,634,441	\$3,636,374	1.00	\$158	\$143	0.90
	ARMY MEDICAL CENTERS	188,948	\$26,991,800	\$26,991,764	1.00	182,284	\$26,041,062	\$31,891,523	0.82	\$143	\$175	1.22
27	NH OAKLAND	14,280	\$1,917,881	\$2,463,643	0.78	13,475	\$1,809,746	\$2,476,430	0.73	\$173	\$184	1.07
29	NH SAN DIEGO	27,454	\$3,687,182	\$7,848,103	0.47	29,828	\$4,006,020	\$7,847,344	0.51	\$286	\$263	0.92
67	NH BETHESDA	22,553	\$3,028,958	\$12,433,665	0.24	23,789	\$3,194,958	\$12,934,796	0.25	\$551	\$544	0.99
124	NH PORTSMOUTH	28,978	\$3,991,881	\$3,346,119	1.16	27,634	\$3,711,357	\$3,256,054	1.14	\$115	\$118	1.02
	NAVY MEDICAL CENTERS	93,295	\$12,525,863	\$26,091,530	0.48	94,726	\$12,722,081	\$26,514,624	0.48	\$280	\$280	1.00
14	DAVID GRANT MED CTR-TRAVIS	15,868	\$2,296,130	\$2,209,439	1.04	13,967	\$2,048,850	\$2,204,531	0.93	\$141	\$158	1.12
55	USAF MED CTR SCOTT	9,047	\$1,325,829	\$1,268,241	1.06	7,636	\$1,118,902	\$1,258,769	0.89	\$140	\$165	1.18
66	MALCOM GROW MED CTR-ANDREWS	13,250	\$1,941,774	\$2,292,370	0.85	11,920	\$1,746,864	\$2,316,747	0.75	\$173	\$194	1.12
73	USAF MED CTR KEESLER	17,195	\$2,519,910	\$2,132,572	1.18	17,218	\$2,523,281	\$2,591,965	0.97	\$124	\$151	1.21
96	USAF MED CTR WRIGHT-PATTERSON	11,079	\$1,623,816	\$1,815,485	0.89	11,350	\$1,663,331	\$1,807,278	0.92	\$164	\$159	0.97
109	BROOKE AMC (JMMC)-FT SAM HOUSTON	32,938	\$4,827,031	\$4,612,428	1.05	31,587	\$4,629,043	\$3,433,635	1.35	\$140	\$109	0.78
117	WILFORD HALL MED CTR-LACKLAND	42,720	\$6,260,573	\$6,454,342	0.97	42,140	\$6,175,575	\$5,456,383	1.13	\$151	\$129	0.86
	USAF MEDICAL CENTERS	141,897	\$20,794,863	\$20,794,877	1.00	135,617	\$19,903,846	\$19,069,308	1.04	\$147	\$140	0.96

given that the Army showed an increased cost per IWU of 22 percent while the Air Force reported a 4 percent decrease and the Navy did not show any change.

It is worth noting that the extreme values reported for the Navy modeled to observed ratios are largely dependent upon the presence of NH San Diego and NH Bethesda. These two facilities were identified in Chapter 2 as outliers and excluded from analysis. Consequently the modeled results for these two hospitals do not compare favorably.

Ambulatory Expenses

As with nonclinician expense models, NH San Diego and NH Bethesda were excluded prior to development of the parameters for ambulatory expense models. FY88 and FY89 modeled and observed ambulatory expenses are displayed in exhibit 5-6. All modeled facilities had estimated ambulatory expenses within 25 percent of observed expenses in both FY88 and FY89. The Army reported an overall increase in ambulatory expenses per AWU of 16 percent while the Navy and Air Force reported increases of 1 percent and 8 percent, respectively. Within the Navy, however, NH Oakland reported a 22 percent increase in expenses per AWU and NH Portsmouth reported a 14 percent decrease per AWU. These changes in expenses per AWU caused the model to less accurately predict FY89 expenses than FY88 expenses.

5.2 CONUS COMMUNITY HOSPITALS

This section presents detailed results from the CONUS community hospital expense models. As with the previous section there are three subsections: Inpatient Nonclinician Expenses, Inpatient Clinician Expenses, and Ambulatory Expenses.

EXHIBIT 5-6: MODELED AND OBSERVED MEDICAL CENTERS AMBULATORY EXPENSES

DMS ID	FACILITY	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY89 AWUs	FY89 MODELED AMBULATORY EXPENSES	FY89 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY89 OBSERVED EXPENSE/AWU	RATIO
22	LETTERMAN AMC-PRESIDIO OF SF	12,081	\$26,048,765	\$29,879,011	0.87	11,150	\$24,349,329	\$31,674,259	0.77	\$2,473	\$2,841	1.15
31	FITZSIMONS AMC-DENVER	17,441	\$35,832,845	\$42,212,909	0.85	18,442	\$37,660,058	\$49,300,595	0.76	\$2,420	\$2,673	1.10
37	WALTER REED AMC-WASHINGTON	28,028	\$55,154,577	\$50,473,287	1.09	28,668	\$52,672,049	\$63,738,996	0.83	\$1,801	\$2,390	1.33
47	EISENHOWER AMC-FT GORDON	15,882	\$32,987,065	\$35,712,866	0.92	16,054	\$33,301,032	\$42,291,310	0.78	\$2,249	\$2,634	1.17
52	TRIPLER AMC-FT SHAFTER	22,007	\$44,187,568	\$47,711,285	0.93	22,608	\$45,260,974	\$56,186,181	0.81	\$2,168	\$2,485	1.15
108	WILLIAM BEAUMONT AMC-FT BLISS	19,888	\$39,934,492	\$35,885,212	1.11	18,817	\$40,169,967	\$35,934,141	1.12	\$1,823	\$1,813	0.99
125	MADIGAN AMC-FT LEWIS	25,816	\$50,755,392	\$42,326,211	1.20	23,708	\$47,272,551	\$48,113,349	1.03	\$1,652	\$1,945	1.18
	ARMY MEDICAL CENTERS	140,741	\$284,880,702	\$284,200,781	1.00	138,443	\$280,485,040	\$325,238,831	0.86	\$2,019	\$2,349	1.16
27	NH OAKLAND	8,064	\$23,527,442	\$24,354,286	0.97	7,825	\$22,979,025	\$28,768,901	0.80	\$3,020	\$3,677	1.22
29	NH SAN DIEGO	14,078	\$37,327,347	\$50,035,749	0.75	16,274	\$42,366,354	\$56,806,158	0.75	\$3,554	\$3,491	0.98
67	NH BETHESDA	13,844	\$36,790,403	\$53,524,844	0.69	13,617	\$36,269,522	\$58,006,444	0.63	\$3,866	\$4,260	1.10
124	NH PORTSMOUTH	13,378	\$35,721,106	\$34,818,163	1.03	15,880	\$41,462,270	\$35,499,908	1.17	\$2,603	\$2,236	0.86
	NAVY MEDICAL CENTERS	49,364	\$133,366,297	\$182,733,042	0.82	53,596	\$143,077,171	\$179,081,411	0.80	\$3,297	\$3,341	1.01
14	DAVID GRANT MED CTR-TRAVIS	10,875	\$26,065,790	\$23,367,717	1.11	11,000	\$26,315,190	\$26,743,038	0.98	\$2,152	\$2,431	1.13
55	USAF MED CTR SCOTT	8,796	\$21,915,779	\$21,234,697	1.03	8,085	\$20,499,188	\$20,083,880	1.02	\$2,414	\$2,484	1.03
66	MALCOM GROW MED CTR-ANDREWS	12,100	\$28,509,908	\$26,432,343	1.08	12,063	\$28,438,086	\$32,164,673	0.88	\$2,184	\$2,666	1.22
73	USAF MED CTR KEESLER	10,903	\$28,121,856	\$25,825,875	1.01	11,100	\$28,514,710	\$28,781,522	0.92	\$2,369	\$2,593	1.08
95	USAF MED CTR WRIGHT-PATTERSON	11,359	\$27,031,468	\$25,869,455	1.04	11,134	\$26,582,547	\$30,703,905	0.87	\$2,277	\$2,758	1.21
108	BROOKE AMC (UMMC)-FT SAM HOUSTON	24,878	\$54,000,558	\$52,863,028	1.02	24,336	\$52,923,151	\$49,709,130	1.06	\$2,125	\$2,043	0.96
117	WILFORD HALL MED CTR-JACKLAND	25,520	\$55,285,485	\$84,027,236	0.88	26,099	\$56,440,685	\$67,949,912	0.83	\$2,509	\$2,604	1.04
	USAF MEDICAL CENTERS	104,428	\$228,930,622	\$239,640,150	1.00	103,817	\$237,711,556	\$256,136,060	0.93	\$2,295	\$2,467	1.06

NOTE: Expenses and workload within the PRIMUS/NAVARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

Inpatient Nonclinician Expenses

Exhibit 5-7 presents inpatient nonclinician expenses for CONUS community hospitals. Womack AH-Fort Bragg (DMIS ID 89) was excluded from the model prior to developing the model parameters. In FY88, two Army facilities had modeled expenses which were more than 25 percent less than observed expenses -- Bassett ACH-Fort Wainwright (DMIS ID 5) and Weed ACH-Fort Irwin (DMIS ID 131). Expenses were also significantly underestimated in FY89 at these two facilities. The fact that these two facilities are relatively small and located in remote areas may contribute to their high cost per IWU. Three facilities, Womack AH, Noble AH-Fort McClellan (DMIS ID 2), and Kenner AH-Fort Lee (DMIS ID 122), had estimated expenses significantly greater than observed expenses in FY88. This pattern continued in FY89 for all three facilities. A 55 percent increase in observed expenses per IWU at IRWIN AH-Fort Riley (DMIS ID 57) caused an inaccurate estimate of FY89 expenses at that facility.

Of 21 Navy CONUS facilities, 5 MTFs had greater than a 25 percent difference between estimated and observed expenses in FY88 and 4 of these facilities had significant differences in FY89. NH Cherry Point (DMIS ID 92) had estimated expenses that were roughly 70 percent greater than observed expenses, and BRH MGAGCC Twenty Nine Palms (DMIS ID 30) had estimated expenses 59 percent greater than observed expenses in FY88 and 43 percent greater in FY89. Estimated expenses were much less than observed expenses at NH Groton (DMIS ID 35) and NH Philadelphia (DMIS ID 99) for both fiscal years. NH Charleston (DMIS ID 103) reported a 16 percent increase in expenses per IWU between FY88 and FY89 and the estimated expenses for FY89 were within 10 percent of observed expenses.

Unlike the Army and Navy, many of the Air Force outliers in FY88 were not outliers in FY89. In both FY88 and FY89, 9 facilities had greater than a 25 percent difference between estimated and observed

EXHIBIT 5-7: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS NONCLINICIAN EXPENSES

5-14

DMIS ID	FACILITY	FY88 IWU's	FY88 MODELED NONCLINICIAN EXPENSES	FY88 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY89 IWU's	FY89 MODELED NONCLINICIAN EXPENSES	FY89 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWU	FY89 OBSERVED EXPENSE/IWU	RATIO
1	FOX AH-REDSTONE ARSENAL	1,889	\$3,981,406	\$3,797,581	1.04	1,929	\$4,031,330	\$4,545,887	0.89	\$2,010	\$2,367	1.17
2	NOBLE AH-FT MCCELLAN	4,024	\$7,693,606	\$5,756,166	1.34	4,610	\$8,717,994	\$6,527,774	1.34	\$1,430	\$1,416	0.99
3	LYSTER AH-FT RUCKER	3,214	\$4,277,642	\$6,577,371	0.95	3,377	\$6,562,583	\$7,086,739	0.93	\$2,046	\$2,099	1.03
5	BASSETT AH-FT WAINWRIGHT	2,286	\$4,655,403	\$7,494,800	0.62	2,472	\$4,980,593	\$7,823,789	0.64	\$3,279	\$3,165	0.97
8	BLISS AH-FT HUACHUCA	3,254	\$6,347,567	\$6,414,863	0.99	2,816	\$5,581,897	\$6,545,298	0.85	\$1,971	\$2,324	1.18
23	HAYS AH-FT ORD	8,893	\$15,865,499	\$17,337,113	0.91	9,018	\$16,423,832	\$18,237,050	0.90	\$1,994	\$2,022	1.01
32	EVANS AH-FT CARSON	7,238	\$13,312,009	\$14,350,223	0.93	8,068	\$14,762,934	\$16,033,153	0.92	\$1,983	\$1,987	1.00
48	MARTIN AH-FT BENNING	12,554	\$22,804,924	\$21,532,526	1.05	11,838	\$21,353,283	\$21,442,987	1.00	\$1,715	\$1,811	1.06
49	WINN AH-FT STEWART	5,292	\$9,910,200	\$12,310,255	0.81	4,854	\$9,319,342	\$13,500,812	0.69	\$2,326	\$2,725	1.17
57	IRWIN AH-FT RILEY	6,254	\$11,591,876	\$12,237,492	0.95	6,432	\$11,903,038	\$19,524,878	0.61	\$1,957	\$3,036	1.55
58	MAUNSON AH-FT LEAVENWORTH	2,300	\$4,679,876	\$5,582,366	0.84	1,922	\$4,019,093	\$5,259,573	0.76	\$2,427	\$2,737	1.13
60	BLANCHFIELD ACH-FT CAMPBELL	10,290	\$18,647,219	\$16,543,846	1.13	8,849	\$15,778,582	\$17,235,524	0.92	\$1,608	\$1,593	1.24
61	IRELAND AH-FT KNOX	9,323	\$16,966,804	\$16,689,634	1.02	8,813	\$16,065,271	\$15,639,244	1.03	\$1,790	\$1,775	0.99
64	BAYNE-JONES AH-FT POLK	5,629	\$10,499,311	\$11,797,196	0.89	5,866	\$10,563,991	\$12,952,107	0.82	\$2,094	\$2,286	1.09
69	KIMBROUGH AH-FT MEADE	3,829	\$7,003,105	\$6,533,919	1.07	4,627	\$8,747,712	\$8,617,585	1.02	\$1,800	\$1,862	1.03
70	CUTLER AH-FT DEVENS	2,380	\$4,794,782	\$4,584,245	1.05	2,098	\$4,328,759	\$4,551,814	0.95	\$1,934	\$2,170	1.12
75	WOOD AH-FT LEONARD WOOD	8,579	\$15,656,215	\$16,020,897	0.98	8,094	\$14,808,385	\$15,667,129	0.95	\$1,867	\$1,936	1.04
81	PATTERSON AH-FT MONMOUTH	1,516	\$3,309,364	\$3,410,528	0.97	1,210	\$2,774,444	\$3,286,521	0.84	\$2,250	\$2,716	1.21
82	WALSON AH-FT DIX	6,161	\$11,429,302	\$12,332,578	0.93	5,452	\$10,189,897	\$12,425,769	0.82	\$2,002	\$2,279	1.14
86	KELLER AH-FT WEST POINT	4,037	\$7,718,331	\$6,499,983	1.19	3,882	\$7,095,755	\$6,774,410	1.05	\$1,610	\$1,840	1.14
89	WOMACK AH-FT BRAGG	15,169	\$27,176,214	\$20,430,575	1.33	15,008	\$26,894,769	\$20,649,913	1.30	\$1,347	\$1,376	1.02
98	REYNOLDS AH-FT SILL	8,288	\$15,147,517	\$13,505,460	1.12	7,857	\$14,394,085	\$13,771,180	1.05	\$1,630	\$1,753	1.08
105	MCNIECE AH-FT JACKSON	8,075	\$14,775,171	\$14,247,016	1.04	8,336	\$15,231,426	\$14,980,519	1.02	\$1,764	\$1,797	1.02
110	DARNALL AH-FT HOOD	12,798	\$23,031,482	\$22,181,686	1.04	14,554	\$26,101,130	\$24,584,432	1.06	\$1,732	\$1,688	0.97
121	MCDONALD AH-FT EUSTIS	3,253	\$6,345,818	\$5,387,649	1.18	2,979	\$5,866,838	\$5,451,511	1.08	\$1,656	\$1,830	1.10
122	KENNER AH-FT LEE	3,885	\$7,415,657	\$5,760,832	1.29	4,662	\$8,908,896	\$6,392,630	1.38	\$1,491	\$1,371	0.92
123	DEWITT AH-FT BELVOIR	6,818	\$12,228,185	\$11,730,394	1.04	6,052	\$11,238,759	\$13,165,958	0.85	\$1,772	\$2,175	1.23
131	WEED ACH-FT IRWIN	1,154	\$2,676,550	\$3,644,061	0.73	1,456	\$3,204,477	\$4,950,895	0.65	\$3,158	\$3,400	1.08
294	HAWLEY AH-FT B. HARRISON	724	\$1,824,868	\$1,773,113	1.03	1,008	\$2,421,327	\$2,135,668	1.13	\$2,449	\$2,119	0.87
	ARMY CONUS HOSPITALS	188,446	\$313,613,862	\$306,414,368	1.02	167,839	\$312,168,180	\$329,740,145	0.95	\$1,619	\$1,687	1.04
7	BRH NAVSTA ADAK	437	\$1,844,767	\$1,617,579	1.14	459	\$1,894,619	\$931,689	2.03	\$3,702	\$2,030	0.55
24	NH CAMP PENDLETON	8,040	\$19,072,960	\$18,235,680	1.05	8,530	\$20,183,287	\$18,517,232	1.09	\$2,268	\$2,171	0.96
25	NH LONG BEACH	4,690	\$11,481,950	\$15,198,352	0.76	4,590	\$11,295,353	\$14,306,482	0.79	\$3,241	\$3,117	0.96
28	NH LEMOORE	1,286	\$3,768,578	\$3,239,818	1.16	904	\$2,902,977	\$3,171,886	0.92	\$2,519	\$3,509	1.39
30	BRH MAGGCC TWENTY NINE PALMS	1,388	\$3,999,708	\$2,512,166	1.59	1,422	\$4,078,751	\$2,851,493	1.43	\$1,810	\$2,005	1.11
35	NH GROTON	2,077	\$5,560,963	\$8,554,320	0.65	1,831	\$5,003,534	\$7,798,445	0.64	\$4,119	\$4,259	1.03
38	NH PENSACOLA	5,285	\$12,830,204	\$14,874,507	0.86	6,831	\$15,980,204	\$15,584,464	1.02	\$2,814	\$2,350	0.84
39	NH JACKSONVILLE	8,425	\$19,945,360	\$19,101,359	1.04	8,399	\$19,886,444	\$21,757,380	0.91	\$2,267	\$2,590	1.14
40	NH ORLANDO	4,779	\$11,683,622	\$11,360,163	1.03	4,886	\$11,926,081	\$11,989,044	0.99	\$2,377	\$2,454	1.03
56	NH GREAT LAKES	6,519	\$15,626,415	\$16,419,298	0.95	5,716	\$13,806,839	\$16,334,998	0.85	\$2,518	\$2,858	1.13
68	NH PATUXENT RIVER	680	\$2,395,399	\$2,072,350	1.16	813	\$3,086,773	\$3,182,243	0.85	\$3,048	\$3,014	1.28
92	NH CAMP LEJEUNE	6,944	\$16,589,454	\$14,083,570	1.18	7,462	\$17,763,228	\$16,463,679	1.08	\$2,028	\$2,206	1.09
91	NH CHERRY POINT	1,862	\$5,073,779	\$2,998,867	1.69	1,696	\$4,697,627	\$2,803,705	1.68	\$1,611	\$1,653	1.03
99	NH PHILADELPHIA	2,209	\$5,860,071	\$7,899,311	0.74	2,113	\$5,842,538	\$7,761,508	0.73	\$3,576	\$3,673	1.03
100	NH NEWPORT	2,254	\$5,962,040	\$7,580,753	0.79	2,279	\$6,018,680	\$7,906,019	0.76	\$3,363	\$3,469	1.03
103	NH CHARLESTON	8,670	\$20,500,523	\$16,252,038	1.26	8,833	\$20,869,877	\$19,159,616	1.09	\$1,875	\$2,169	1.16

Continued --

**EXHIBIT D-7: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS NONCLINICIAN EXPENSES
(CONTINUED)**

5-15

DMIS ID	FACILITY	FY88 IWUs	FY88 MODELED NONCLINICIAN EXPENSES	FY88 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY89 IWUs	FY89 MODELED NONCLINICIAN EXPENSES	FY89 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWU	FY89 OBSERVED EXPENSE/IWU	RATIO
104	NH BEAUFORT	2,427	\$6,364,054	\$6,276,255	1.01	2,322	\$6,116,126	\$6,810,946	0.93	\$2,586	\$2,847	1.10
107	NH MILLINGTON	2,784	\$7,183,006	\$7,994,149	0.90	2,825	\$7,255,911	\$8,583,138	0.85	\$2,871	\$3,038	1.06
118	NH CORPUS CHRISTI	1,713	\$4,736,149	\$5,005,403	0.95	1,806	\$4,493,890	\$5,832,540	0.77	\$2,922	\$3,237	1.24
126	NH BREMERTON	4,607	\$11,293,875	\$11,252,460	1.00	4,099	\$10,142,760	\$9,862,043	1.03	\$2,442	\$2,406	0.99
127	NH OAK HARBOR	1,295	\$3,788,972	\$3,154,498	1.20	1,194	\$3,560,109	\$2,936,571	1.21	\$2,436	\$2,459	1.01
	NAVY CONUS HOSPITALS	78,371	\$195,531,848	\$195,882,804	1.00	78,610	\$196,073,416	\$204,345,131	0.96	\$2,497	\$2,599	1.04
4	AIR UNIVERSITY RGN HOSP-MAXWELL	3,269	\$6,522,156	\$7,154,279	0.91	3,428	\$6,806,574	\$5,104,871	1.33	\$2,189	\$1,489	0.68
6	USAF HOSP ELMENDORF	5,599	\$10,690,048	\$13,193,521	0.81	4,771	\$9,208,926	\$13,309,487	0.69	\$2,356	\$2,790	1.18
9	832nd MED GRP-LUKE	3,375	\$6,711,768	\$6,478,137	1.04	3,207	\$6,411,251	\$7,688,092	0.83	\$1,919	\$2,397	1.25
10	836th MED GRP-DAVIS MONTHAN	2,939	\$5,931,854	\$6,780,980	0.88	2,756	\$5,604,504	\$6,548,096	0.86	\$2,300	\$2,376	1.03
11	USAF HOSP WILLIAMS	1,058	\$2,583,553	\$3,281,866	0.78	1,093	\$2,629,738	\$3,907,040	0.67	\$3,108	\$3,575	1.15
12	97th STRAT HOSP-EAKER	1,133	\$2,701,290	\$2,803,078	0.96	953	\$2,379,307	\$2,895,246	0.82	\$2,474	\$3,038	1.23
13	USAF HOSP LITTLE ROCK	1,399	\$3,177,109	\$2,884,365	1.10	2,096	\$4,423,899	\$3,817,061	1.16	\$2,062	\$1,821	0.88
15	9th STRAT HOSP-BEALE	1,438	\$3,246,872	\$3,217,569	1.01	1,467	\$3,298,747	\$3,336,627	0.99	\$2,238	\$2,274	1.02
16	USAF HOSP MATHER	3,602	\$7,117,825	\$7,885,046	0.90	3,280	\$6,541,833	\$8,280,524	0.79	\$2,189	\$2,525	1.15
17	93rd STRAT HOSP-CASTLE	1,858	\$3,640,407	\$3,134,914	1.16	1,627	\$3,584,955	\$3,343,943	1.07	\$1,891	\$2,065	1.09
18	1st STRAT HOSP-VANDENBERG	1,825	\$3,939,136	\$3,619,595	1.09	1,621	\$3,574,222	\$3,779,994	0.95	\$1,983	\$2,332	1.18
19	USAF HOSP EDWARDS	1,128	\$2,692,346	\$3,112,771	0.86	1,105	\$2,651,204	\$2,391,907	1.11	\$2,760	\$2,165	0.78
20	831st MED GRP-GEORGE	1,881	\$4,039,309	\$3,692,286	1.09	1,839	\$3,964,179	\$3,681,493	1.08	\$1,963	\$2,002	1.02
21	22nd STRAT HOSP-MARCH	4,518	\$8,756,361	\$10,529,558	0.83	4,206	\$8,198,257	\$11,182,190	0.73	\$2,331	\$2,659	1.14
33	USAF ACADEMY HOSP	4,592	\$8,888,732	\$9,616,194	0.92	4,449	\$8,632,934	\$10,474,080	0.82	\$2,094	\$2,354	1.12
36	USAF HOSP DOVER	1,601	\$3,538,448	\$2,872,075	1.23	1,367	\$3,119,868	\$2,391,907	0.85	\$1,794	\$2,671	1.49
42	USAF RGN HOSP EGLIN	8,508	\$15,863,653	\$15,623,421	1.02	8,030	\$15,038,609	\$15,875,856	0.95	\$1,836	\$1,977	1.08
43	325th MED GRP-TYNDALL	1,623	\$3,577,799	\$4,999,323	0.72	2,237	\$4,678,120	\$5,675,886	0.82	\$3,080	\$2,537	0.82
44	31st MED GRP-HOMESTEAD	3,225	\$6,443,449	\$7,003,111	0.92	2,988	\$6,015,927	\$7,673,113	0.78	\$2,172	\$2,570	1.18
45	58th MED GRP-MACDILL	4,110	\$8,026,533	\$7,946,228	1.01	4,099	\$8,006,856	\$8,782,314	0.91	\$1,933	\$2,143	1.11
48	USAF HOSP PATRICK	968	\$2,406,139	\$2,150,169	1.12	716	\$1,955,362	\$1,795,968	1.09	\$2,221	\$2,508	1.13
50	347th MED GRP-MOODY	1,346	\$3,062,303	\$3,386,050	0.91	1,249	\$2,908,790	\$3,564,528	0.82	\$2,516	\$2,854	1.13
51	USAF HOSP ROBINS	1,487	\$3,334,523	\$3,583,117	0.94	1,285	\$2,973,187	\$3,493,695	0.85	\$2,396	\$2,719	1.13
53	368th MED GRP-MOUNTAIN HOME	1,389	\$3,159,221	\$3,139,602	1.01	1,292	\$2,985,708	\$2,907,790	1.03	\$2,260	\$2,251	1.00
54	USAF HOSP CHANUTE	1,568	\$3,479,416	\$3,410,381	1.02	1,120	\$2,678,036	\$2,737,244	0.98	\$2,175	\$2,444	1.12
59	364th STRAT HOSP-MCCONNELL	481	\$1,534,996	\$1,529,971	1.00	480	\$1,533,207	\$1,570,456	0.98	\$3,181	\$3,272	1.03
62	2nd STRAT HOSP-BARKSDALE	3,378	\$6,717,135	\$6,137,274	1.09	3,039	\$6,110,733	\$6,015,600	1.02	\$1,817	\$1,979	1.09
63	23rd MED GRP-ENGLAND	1,085	\$2,615,428	\$3,129,065	0.84	1,115	\$2,669,092	\$3,366,173	0.79	\$2,884	\$3,019	1.05
65	42nd STRAT HOSP-LORING	1,364	\$3,114,502	\$2,556,199	1.22	1,139	\$2,712,023	\$2,582,281	1.05	\$1,874	\$2,267	1.21
71	376th STRAT HOSP-WURTSMITH	1,091	\$2,626,180	\$2,810,017	0.93	986	\$2,438,337	\$2,925,797	0.83	\$2,576	\$2,967	1.15
72	410th STRAT HOSP-K.I.SAWYER	1,011	\$2,483,057	\$2,618,112	0.95	1,082	\$2,610,061	\$2,890,013	0.91	\$2,590	\$2,662	1.03
74	USAF HOSP COLUMBUS	440	\$1,481,655	\$1,795,673	0.81	481	\$1,499,220	\$1,797,149	0.83	\$4,081	\$3,898	0.96
76	351st STRAT HOSP-WHITEMAN	1,488	\$3,336,312	\$2,790,584	1.20	1,520	\$3,393,554	\$2,958,416	1.15	\$1,875	\$1,946	1.04
77	341st STRAT HOSP-MALMSTROM	530	\$1,622,646	\$1,088,438	1.52	---	---	---	---	\$3,062	---	---
78	EHRLING BERQUIST RGN HOSP-OFFUTT	4,983	\$9,588,151	\$7,720,969	1.24	5,015	\$9,645,392	\$12,475,152	0.77	\$1,549	\$2,488	1.61
79	564th MED GRP-NELLIS	2,392	\$4,953,383	\$4,773,888	1.05	2,727	\$5,552,829	\$4,762,786	1.17	\$1,975	\$1,747	0.88
80	509th STRAT HOSP-PEASE	2,238	\$4,677,908	\$5,071,703	0.92	2,457	\$5,069,654	\$5,222,699	0.97	\$2,266	\$2,126	0.94
83	USAF HOSP KIRTLAND	2,738	\$5,572,306	\$4,461,483	1.25	2,501	\$5,143,361	\$3,880,840	1.33	\$1,629	\$1,552	0.95
84	833rd MED GRP-HOLLOWAN	1,314	\$3,025,062	\$3,318,521	0.91	1,316	\$3,028,639	\$3,342,257	0.91	\$2,526	\$2,540	1.01
85	27th MED GRP-CANNON	1,416	\$3,207,519	\$3,394,620	0.94	1,233	\$2,880,169	\$3,206,337	0.90	\$2,397	\$2,600	1.08
87	360th STRAT HOSP-PLATTSBURGH	868	\$2,227,259	\$1,648,778	1.35	691	\$1,910,642	\$1,740,572	1.10	\$1,900	\$2,519	1.33
88	416th STRAT HOSP-GRIFFISS	1,196	\$2,813,984	\$2,983,278	0.94	1,154	\$2,739,855	\$3,375,510	0.81	\$2,494	\$2,925	1.17
90	4th MED GRP-SEYMOUR JOHNSON	1,217	\$2,851,549	\$2,454,118	1.16	1,389	\$3,159,221	\$2,965,353	1.07	\$2,017	\$2,135	1.06

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**EXHIBIT 5-7: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS NONCLINICIAN EXPENSES
(CONCLUDED)**

DMIS ID	FACILITY	FY88 IWUs	FY88 MODELED NONCLINICIAN EXPENSES	FY88 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY89 IWUs	FY89 MODELED NONCLINICIAN EXPENSES	FY89 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWU	FY89 OBSERVED EXPENSE/IWU	RATIO
93	842nd STRAT HOSP-GRAND FORKS	1,749	\$3,803,188	\$2,718,073	1.40	1,470	\$3,304,114	\$3,030,801	1.09		\$1,553	
94	867th STRAT HOSP-MINOT	2,894	\$5,493,599	\$4,741,741	1.16	2,440	\$5,039,245	\$4,942,420	1.02	\$1,760	\$2,062	1.33
96	USAF HOSP TINKER	2,785	\$5,666,379	\$4,543,449	1.24	2,377	\$4,926,551	\$2,286,482	2.15	\$1,631	\$982	1.15
97	USAF HOSP ALTUS	1,118	\$2,674,458	\$2,582,749	1.04	1,004	\$2,470,535	\$3,115,730	0.79	\$2,292	\$3,103	0.59
101	363rd MED GRP-SHAW	2,053	\$4,348,981	\$6,280,182	0.69	2,027	\$4,300,473	\$3,351,085	1.28	\$3,059	\$1,653	1.35
102	364th MED GRP-MYRTLE BEACH	909	\$2,300,600	\$2,274,591	1.01	779	\$2,088,056	\$2,302,244	0.90	\$2,502		0.54
106	44th STRAT HOSP-ELLSWORTH	2,795	\$5,674,267	\$4,396,919	1.29	2,298	\$4,785,236	\$4,526,281	1.06	\$1,573	\$1,970	1.18
111	USAF HOSP REESE	608	\$1,782,173	\$1,960,650	0.90	410	\$1,407,991	\$1,599,746	0.88	\$3,225	\$3,902	1.25
112	98th STRAT HOSP-DYESS	2,853	\$5,420,258	\$3,700,882	1.46	2,397	\$4,962,327	\$4,178,351	1.19	\$1,395	\$1,743	1.21
113	USAF RGN HOSP SHEPPARD	5,042	\$9,693,690	\$11,744,390	0.83	4,985	\$9,591,728	\$12,283,857	0.78	\$2,329	\$2,464	1.06
114	USAF HOSP LAUGHLIN	847	\$2,189,695	\$2,422,571	0.90	676	\$1,883,811	\$2,897,676	0.65	\$2,860	\$4,287	1.50
115	67th MED GRP-BERGSTROM	1,382	\$3,146,700	\$3,447,528	0.91	1,130	\$2,695,923	\$2,758,342	0.98	\$2,495	\$2,441	0.98
116	R. THOMPSON STRAT HOSP-CARSWELL	6,825	\$12,883,111	\$13,415,024	0.96	7,111	\$13,394,706	\$14,621,668	0.92	\$1,966	\$2,056	1.05
119	USAF HOSP HILL	2,161	\$4,540,171	\$3,489,097	1.30	2,031	\$4,307,628	\$4,005,783	1.08	\$1,614	\$1,972	1.22
120	1st MED GRP-LANGLEY	4,514	\$8,749,206	\$8,690,989	1.01	4,045	\$7,910,261	\$8,727,800	0.91	\$1,925	\$2,158	1.12
128	92nd STRAT HOSP-FAIRCHILD	2,879	\$5,466,767	\$4,938,872	1.11	2,995	\$6,032,026	\$5,530,857	1.09	\$1,843	\$1,847	1.00
129	90th STRAT HOSP-F.E. WARREN	1,899	\$4,071,507	\$3,115,722	1.31	1,561	\$3,486,894	\$2,547,962	1.36	\$1,641	\$1,632	0.99
	USAF CONUS HOSPITALS	137,180	\$285,862,006	\$286,108,742	1.00	130,320	\$272,916,288	\$293,672,835	0.93	\$2,086	\$2,253	1.08

expenses. However, only 4 of these facilities had greater than a 25 percent difference in both fiscal years. Additionally, since 16 of the 59 Air Force CONUS facilities had greater than a 20 percent change in nonclinician expenses per IWU (overall, unit costs increased 8 percent at Air Force CONUS facilities), estimates for many facilities were relatively accurate for only one fiscal year. Note, 341st Strategic Hospital-Malmstrom was changed to a clinic in FY89 and therefore FY89 estimates were not completed.

Inpatient Clinician Expenses

Clinician expenses for CONUS community hospitals are presented in exhibit 5-8. Of all 110 CONUS hospitals modeled, estimated expenses were more than 25 percent different from observed expenses for 41 facilities in FY88, 41 facilities in FY89, and 21 facilities in both fiscal years. More than a quarter of the facilities had greater than a 15 percent change in clinician expenses per IWU, yet overall clinician expenses per IWU increased only 7 percent for the Army, 4 percent for the Air Force, and 12 percent for the Navy. The Navy had the most variation, with 6 of 21 facilities reporting greater than a 20 percent decrease in clinician expenses per IWU and 8 facilities reporting more than a 20 percent increase in clinician expenses per IWU. Furthermore, estimated expenses deviated by more than 25 percent from observed expenses for 15 of the 21 Navy facilities in FY88 and FY89.

These observed results may be ascribed to data reporting problems, changes or differences in accounting methods, or other factors which cannot or have not been considered within the model. Changes in personnel mixes, including the use of contract clinicians in place of military personnel, may cause some changes in unit expenses. Not all observed changes, however, appear attributable to this explanation.

EXHIBIT 5-8: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS CLINICIAN EXPENSES

DMIS ID	FACILITY	FY88 IWUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY89 IWUs	FY88 MODELED CLINICIAN EXPENSES	FY89 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWU	FY89 OBSERVED EXPENSE/IWU	RATIO
56	NH GREAT LAKES	6,519	\$1,041,886	\$1,537,887	0.68	5,716	\$913,548	\$599,325	1.52	\$236	\$105	0.44
68	NH PATUXENT RIVER	680	\$108,680	\$90,435	1.20	813	\$129,936	\$65,210	1.99	\$133	\$80	0.60
91	NH CAMP LELEUNE	6,944	\$1,109,811	\$830,344	1.34	7,462	\$1,192,599	\$1,285,343	0.94	\$120	\$170	1.42
92	NH CHERRY POINT	1,862	\$297,590	\$1,042,430	0.29	1,696	\$271,060	\$2,130,774	0.13	\$560	\$1,256	2.24
99	NH PHILADELPHIA	2,209	\$353,049	\$179,734	1.96	2,113	\$337,706	\$330,344	1.02	\$81	\$156	1.92
100	NH NEWPORT	2,254	\$360,241	\$174,439	2.07	2,279	\$384,237	\$180,344	2.02	\$77	\$79	1.02
103	NH CHARLESTON	8,070	\$1,385,665	\$1,023,988	1.35	8,833	\$1,411,717	\$1,237,026	1.14	\$118	\$140	1.19
104	NH BEAUFORT	2,427	\$387,890	\$239,031	1.62	2,322	\$371,109	\$268,319	1.38	\$98	\$116	1.17
107	NH MILLINGTON	2,784	\$444,947	\$1,342,120	0.33	2,825	\$451,500	\$1,139,855	0.40	\$482	\$403	0.84
118	NH CORPUS CHRISTI	1,713	\$273,777	\$159,604	1.72	1,806	\$256,676	\$331,404	0.77	\$93	\$206	2.21
126	NH BREMERTON	4,607	\$736,305	\$583,578	1.26	4,099	\$655,114	\$378,867	1.73	\$127	\$92	0.73
127	NH OAK HARBOR	1,295	\$206,971	\$107,041	1.93	1,194	\$190,829	\$66,792	2.86	\$83	\$56	0.68
	NAVY CONUS HOSPITALS	78,371	\$12,525,488	\$12,525,306	1.00	78,610	\$12,563,686	\$14,048,139	0.89	\$160	\$179	1.12
4	AIR UNIVERSITY RGN HOSP-MAXWELL	3,269	\$310,993	\$350,322	0.89	3,428	\$326,119	\$335,684	0.97	\$107	\$98	0.91
6	USAF HOSP ELMENDORF	5,599	\$532,655	\$585,174	0.91	4,771	\$453,884	\$431,276	1.05	\$105	\$90	0.86
9	832nd MED GRP-LUKE	3,375	\$321,077	\$377,829	0.85	3,207	\$305,095	\$357,589	0.85	\$112	\$112	1.00
10	836th MED GRP-DAVIS MONTHAN	2,939	\$278,599	\$300,636	0.93	2,756	\$262,189	\$294,252	0.89	\$102	\$107	1.04
11	USAF HOSP WILLIAMS	1,056	\$100,482	\$109,223	0.92	1,093	\$103,981	\$31,008	3.35	\$103	\$28	0.27
12	87th STRAT HOSP-EAKER	1,133	\$107,787	\$100,778	1.07	953	\$90,663	\$100,699	0.90	\$89	\$106	1.19
13	USAF HOSP LITTLE ROCK	1,399	\$133,092	\$107,455	1.24	2,096	\$199,401	\$164,400	1.21	\$77	\$78	1.02
15	8th STRAT HOSP-BEALE	1,438	\$136,803	\$202,393	0.68	1,467	\$139,562	\$169,507	0.74	\$141	\$129	0.92
16	USAF HOSP MATHER	3,602	\$342,673	\$475,744	0.72	3,280	\$312,040	\$377,586	0.83	\$132	\$115	0.87
17	80th STRAT HOSP-CASTLE	1,658	\$157,732	\$170,032	0.93	1,627	\$154,783	\$153,319	1.01	\$103	\$94	0.92
18	1st STRAT HOSP-VANDENBERG	1,825	\$173,620	\$126,489	1.37	1,821	\$154,212	\$99,192	1.55	\$69	\$61	0.88
19	USAF HOSP EDWARDS	1,128	\$107,311	\$135,050	0.79	1,105	\$105,123	\$142,260	0.74	\$120	\$129	1.08
20	831st MED GRP-GEORGE	1,881	\$178,947	\$173,217	1.03	1,839	\$174,951	\$134,249	1.30	\$92	\$73	0.79
21	22nd STRAT HOSP-MARCH	4,518	\$429,815	\$591,370	0.73	4,208	\$400,134	\$526,988	0.76	\$131	\$125	0.96
33	USAF ACADEMY HOSP	4,592	\$436,855	\$348,844	1.25	4,449	\$423,251	\$364,337	1.16	\$76	\$82	1.08
36	USAF HOSP DOVER	1,601	\$152,310	\$71,556	2.13	1,367	\$130,048	\$153,303	0.85	\$45	\$112	2.51
42	USAF RGN HOSP EGLIN	6,508	\$809,400	\$432,027	1.87	6,030	\$763,926	\$748,977	1.02	\$51	\$93	1.84
43	325th MED GRP-TYNDALL	1,623	\$154,402	\$213,933	0.72	2,237	\$212,815	\$220,563	0.96	\$132	\$99	0.75
44	31st MED GRP-HOMESTEAD	3,225	\$306,807	\$276,863	1.11	2,986	\$284,070	\$339,374	0.84	\$86	\$114	1.32
45	56th MED GRP-MACDILL	4,110	\$391,001	\$444,136	0.88	4,099	\$389,954	\$448,022	0.87	\$108	\$109	1.01
46	USAF HOSP PATRICK	968	\$92,090	\$119,265	0.77	716	\$68,116	\$84,980	0.72	\$123	\$133	1.08
50	347th MED GRP-MOODY	1,346	\$128,050	\$151,964	0.84	1,249	\$116,922	\$153,904	0.77	\$113	\$123	1.09
51	USAF HOSP ROBINS	1,487	\$141,464	\$130,373	1.09	1,285	\$122,247	\$133,333	0.92	\$88	\$104	1.18
53	366th MED GRP-MOUNTAIN HOME	1,389	\$132,141	\$163,904	0.81	1,292	\$122,913	\$129,859	0.95	\$118	\$101	0.85
54	USAF HOSP CHANUTE	1,568	\$148,170	\$119,936	1.24	1,120	\$106,550	\$103,007	1.03	\$76	\$92	1.20
59	384th STRAT HOSP-MCCONNELL	481	\$45,759	\$24,042	1.90	480	\$45,664	\$33,604	1.36	\$50	\$70	1.40

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**EXHIBIT 5-8: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS CLINICIAN EXPENSES
(CONTINUED)**

DMIS ID	FACILITY	FY88 IMUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 IMUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 OBSERVED/IMU EXPENSE/IMU	FY88 OBSERVED/IMU EXPENSE/IMU	RATIO
1	FOX AH-REDSTONE ARSENAL	1,889	\$193,891	\$194,432	1.00	1,929	\$197,996	\$254,852	0.78	\$103	\$132	1.28
2	NOBLE AH-FT MCCELLELLAN	4,024	\$413,031	\$280,584	1.47	4,810	\$473,180	\$284,212	1.66	\$70	\$62	0.88
3	LYSTER AH-FT RUCKER	3,214	\$329,891	\$313,526	1.05	3,377	\$346,822	\$246,721	1.40	\$98	\$73	0.75
5	BASSETT ACH-FT WAINWRIGHT	2,286	\$234,640	\$330,913	0.71	2,472	\$253,731	\$280,088	0.91	\$145	\$113	0.78
8	BLISS AH-FT HUACHUCA	3,254	\$333,997	\$440,377	0.76	2,816	\$289,040	\$388,828	0.74	\$135	\$138	1.02
23	HAYS AH-FT ORD	8,893	\$892,267	\$1,239,963	0.72	9,018	\$925,626	\$1,340,418	0.69	\$143	\$149	1.04
32	EVANS AH-FT CARSON	7,238	\$742,923	\$776,427	0.96	8,068	\$828,116	\$876,653	0.94	\$107	\$109	1.01
48	MARTIN AH-FT BENNING	12,554	\$1,288,568	\$1,572,009	0.82	11,838	\$1,215,076	\$1,433,695	0.85	\$125	\$121	0.97
49	WINN AH-FT STEWART	5,292	\$543,181	\$569,872	0.95	4,954	\$508,488	\$695,437	0.73	\$108	\$140	1.30
57	IRWIN AH-FT RILEY	8,254	\$841,923	\$624,795	1.03	6,432	\$660,193	\$784,077	0.84	\$100	\$122	1.22
58	MUNSON AH-FT LEAVENWORTH	2,300	\$236,077	\$239,226	0.99	1,922	\$197,278	\$187,480	1.05	\$104	\$98	0.94
60	BLANCHFIELD ACH-FT CAMPBELL	10,290	\$1,056,186	\$585,153	1.80	8,849	\$887,751	\$ 80,127	1.53	\$57	\$67	1.18
61	IRELAND AH-FT KNOX	9,323	\$956,931	\$559,228	1.71	8,813	\$904,584	\$674,444	1.34	\$60	\$77	1.28
64	BAYNE-JONES AH-FT POLK	5,829	\$577,772	\$610,982	0.95	5,666	\$581,570	\$764,727	0.76	\$109	\$135	1.24
69	KIMBROUGH AH-FT MEADE	3,629	\$372,488	\$298,137	1.25	4,627	\$474,925	\$385,463	1.23	\$82	\$83	1.01
70	CUTLER AH-FT DEVENS	2,360	\$242,235	\$224,273	1.08	2,098	\$215,343	\$183,268	1.18	\$95	\$87	0.92
75	WOOD AH-FT LEONARD WOOD	8,579	\$880,568	\$729,164	1.21	8,094	\$830,784	\$703,206	1.18	\$85	\$87	1.02
81	PATTERSON AH-FT MONMOUTH	1,518	\$155,605	\$142,028	1.10	1,210	\$124,197	\$205,730	0.60	\$94	\$170	1.81
82	WALSON AH-FT DIX	6,161	\$632,377	\$479,797	1.32	5,452	\$559,804	\$733,101	0.76	\$78	\$134	1.73
86	KELLER AH-FT WEST POINT	4,037	\$414,366	\$622,404	0.67	3,682	\$377,928	\$592,076	0.64	\$154	\$161	1.04
89	WOMACK AH-FT BRAGG	15,169	\$1,556,976	\$1,846,882	0.85	15,008	\$1,540,451	\$1,854,569	0.83	\$109	\$124	1.14
98	REYNOLDS AH-FT SILL	8,238	\$850,697	\$860,226	0.99	7,857	\$806,458	\$940,238	0.86	\$104	\$120	1.15
105	MONCIEF AH-FT JACKSON	8,075	\$828,834	\$655,731	1.26	8,336	\$855,624	\$640,433	1.34	\$81	\$77	0.95
110	DARNALL AH-FT HOOD	12,798	\$1,313,612	\$1,493,570	0.88	14,554	\$1,493,852	\$1,528,143	0.98	\$117	\$105	0.90
121	MACDONALD AH-FT ELUSTIS	3,253	\$333,894	\$293,906	1.14	2,979	\$305,771	\$357,461	0.86	\$90	\$120	1.33
122	KENNER AH-FT LEE	3,865	\$396,711	\$342,909	1.16	4,662	\$478,517	\$353,162	1.35	\$89	\$76	0.85
123	DEWITT AH-FT BELVOIR	6,818	\$678,285	\$970,478	0.70	6,052	\$621,189	\$866,868	0.72	\$147	\$143	0.98
131	WEED ACH-FT IRWIN	1,154	\$118,449	\$110,870	1.07	1,458	\$149,447	\$148,411	1.01	\$96	\$102	1.06
294	HAWLEY AH-FT B. HARRISON	724	\$74,313	\$83,618	0.89	1,008	\$103,463	\$88,207	1.17	\$115	\$88	0.76
	ARMY CONUS HOSPITALS	188,466	\$17,291,687	\$17,291,478	1.00	187,639	\$17,208,802	\$18,370,095	0.94	\$103	\$110	1.07
7	BRH NAVSTA ADAK	437	\$68,843	\$39,243	1.78	459	\$73,359	\$30,912	2.37	\$90	\$67	0.75
24	NH CAMP PENDLETON	8,040	\$1,284,977	\$1,535,130	0.84	8,530	\$1,363,290	\$1,512,571	0.90	\$191	\$177	0.93
25	NH LONG BEACH	4,890	\$422,434	\$222,434	1.77	4,590	\$733,588	\$450,518	1.63	\$90	\$98	1.09
28	NH LEAHOE	1,286	\$205,532	\$272,104	0.76	904	\$144,480	\$276,248	0.52	\$212	\$306	1.44
30	BRH MAGAGC TWENTY NINE PALMS	1,388	\$221,834	\$208,530	1.06	1,422	\$227,268	\$481,387	0.47	\$150	\$339	2.25
35	NH GROTON	2,077	\$331,952	\$419,690	0.79	1,831	\$292,636	\$393,927	0.74	\$202	\$215	1.06
38	NH PENSACOLA	5,285	\$844,665	\$655,304	1.29	6,631	\$1,059,788	\$840,739	1.65	\$124	\$97	0.78
39	NH JACKSONVILLE	8,425	\$1,346,509	\$803,624	1.68	8,399	\$1,342,353	\$1,198,736	1.12	\$95	\$142	1.49
40	NH ORLANDO	4,779	\$783,794	\$858,606	0.89	4,886	\$780,895	\$1,071,498	0.73	\$180	\$219	1.22

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**EXHIBIT 5-8: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS CLINICIAN EXPENSES
(CONCLUDED)**

5-20

DMIS ID	FACILITY	FY88 IMUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 IMUs	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IMU	FY88 OBSERVED EXPENSE/IMU	RATIO
62	2nd STRAT HOSP-BARKSDALE	3,378	\$321,383	\$373,216	0.86	3,039	\$289,112	\$317,505	0.91	\$110	\$104	0.95
63	23rd MED GRP-ENGLAND	1,085	\$103,220	\$89,272	1.49	1,115	\$106,074	\$106,243	1.00	\$64	\$95	1.49
65	42nd STRAT HOSP-LORING	1,384	\$129,783	\$103,840	1.25	1,139	\$108,358	\$104,076	1.04	\$76	\$91	1.20
71	379th STRAT HOSP-WURTSMITH	1,091	\$103,791	\$96,193	1.08	886	\$93,802	\$101,811	0.92	\$88	\$103	1.17
72	410th STRAT HOSP-K.I.SAWYER	1,011	\$96,180	\$111,109	0.87	1,082	\$102,935	\$110,450	0.93	\$110	\$102	0.93
74	USAF HOSP COLUMBUS	440	\$41,859	\$23,596	1.77	461	\$43,857	\$40,218	1.09	\$54	\$87	1.63
76	351st STRAT HOSP-WHITEMAN	1,488	\$141,559	\$143,850	0.99	1,520	\$144,604	\$137,485	1.05	\$97	\$90	0.94
77	341st STRAT HOSP-MALMSTROM	530	\$50,421	\$31,286	1.61	-----	-----	-----	-----	\$59	-----	-----
78	EHRLING BEROUST RGN HOSP-CFFUTT	4,983	\$474,053	\$398,740	1.19	5,015	\$477,097	\$460,094	1.04	\$80	\$92	1.15
79	554th MED GRP-NELLIS	2,392	\$227,581	\$147,584	1.54	2,727	\$259,430	\$259,202	1.00	\$62	\$95	1.54
80	509th STRAT HOSP-PEASE	2,238	\$212,910	\$235,906	0.90	2,457	\$233,744	\$264,139	0.88	\$105	\$108	1.02
83	USAF HOSP KIRTLAND	2,738	\$260,477	\$220,260	1.18	2,501	\$237,930	\$112,084	2.12	\$80	\$45	0.56
84	833rd MED GRP-HOLLOWAN	1,314	\$125,006	\$144,102	0.87	1,316	\$125,196	\$151,077	0.83	\$110	\$115	1.05
85	27th MED GRP-CANNON	1,418	\$134,710	\$118,408	1.16	1,233	\$117,300	\$154,250	0.76	\$82	\$125	1.52
87	380th STRAT HOSP-PLATTSBURGH	868	\$82,576	\$77,735	1.06	691	\$65,738	\$63,730	1.03	\$90	\$92	1.03
88	418th STRAT HOSP-GRIFFISS	1,196	\$113,780	\$99,919	1.14	1,154	\$109,785	\$114,469	0.96	\$84	\$99	1.19
90	4th MED GRP-SEYMOUR JOHNSON	1,217	\$115,778	\$99,777	1.16	1,389	\$132,141	\$113,452	1.16	\$82	\$82	1.00
93	842nd STRAT HOSP-GRAND FORKS	1,749	\$166,389	\$153,221	1.09	1,470	\$139,847	\$138,465	1.01	\$88	\$94	1.08
94	857th STRAT HOSP-MINOT	2,694	\$256,291	\$350,628	0.73	2,440	\$232,127	\$264,580	0.88	\$130	\$108	0.83
96	USAF HOSP TINKER	2,785	\$284,948	\$181,276	1.46	2,377	\$226,134	\$100,466	2.25	\$65	\$42	0.65
97	USAF HOSP ALTUS	1,118	\$106,360	\$111,194	0.96	1,004	\$95,515	\$121,309	0.79	\$99	\$121	1.21
101	363rd MED GRP-SHAW	2,053	\$195,310	\$258,690	0.75	2,027	\$192,837	\$109,683	1.76	\$126	\$54	0.43
102	354th MED GRP-MYRTLE BEACH	909	\$86,477	\$89,725	0.96	779	\$74,109	\$93,662	0.79	\$99	\$120	1.22
106	44th STRAT HOSP-ELLSWORTH	2,795	\$265,900	\$242,128	1.10	2,298	\$218,618	\$197,838	1.11	\$87	\$86	0.99
111	USAF HOSP REESE	608	\$57,841	\$127,542	0.45	410	\$39,005	\$38,195	1.02	\$21	\$93	4.48
112	96th STRAT HOSP-DYESS	2,653	\$252,391	\$208,440	1.22	2,397	\$228,036	\$198,999	1.15	\$78	\$83	1.07
113	USAF RGN HOSP SHEPPARD	5,042	\$479,666	\$573,668	0.84	4,985	\$474,243	\$628,804	0.75	\$114	\$126	1.11
114	USAF HOSP LAUGHLIN	847	\$80,578	\$72,264	1.12	676	\$64,311	\$53,101	1.21	\$85	\$79	0.92
115	67th MED GRP-BERGSTROM	1,382	\$131,475	\$127,542	1.03	1,130	\$107,501	\$83,030	1.29	\$92	\$73	0.80
116	R. THOMPSON STRAT HOSP-CARSWELL	6,825	\$649,290	\$731,170	0.89	7,111	\$676,498	\$927,928	0.73	\$107	\$130	1.22
119	USAF HOSP HILL	2,181	\$205,585	\$175,359	1.17	2,031	\$193,217	\$105,979	1.82	\$81	\$52	0.64
120	1st MED GRP-LANGLEY	4,514	\$429,435	\$464,721	0.92	4,045	\$384,817	\$450,121	0.85	\$103	\$111	1.08
128	92nd STRAT HOSP-FAIRCHILD	2,679	\$254,864	\$346,716	0.74	2,995	\$284,926	\$360,343	0.79	\$129	\$120	0.93
129	90th STRAT HOSP-F.E. WARREN	1,899	\$180,659	\$158,326	1.14	1,561	\$148,504	\$115,453	1.29	\$83	\$74	0.89
	USAF CONUS HOSPITALS	137,160	\$13,050,482	\$13,050,468	1.00	130,320	\$12,397,863	\$12,859,313	0.96	\$95	\$90	1.04

Ambulatory Expenses

Modeled and observed ambulatory expenses for CONUS community hospitals are presented in exhibit 5 9. For the Army, there are only two facilities with more than a 25 percent difference between observed and estimated expenses -- Womack AH-Fort Bragg (DMIS ID 89), and Patterson AH-Fort Monmouth (DMIS ID 81). Both had substantial differences in FY88 and FY89, though less so in FY89. Weed AH-Fort Irwin (DMIS ID 131) reported a 15 percent increase in expenses per AWU and Irwin AH-Fort Riley (DMIS ID 57) reported a 61 percent increase in costs per AWU and estimated expenses were significantly different from observed expenses in FY89. Overall, the Army reported a 9 percent increase in outpatient costs per AWU.

For the Navy, 7 of 21 facilities had greater than a 25 percent difference between observed and estimated outpatient expenses in FY88, 9 of 21 facilities in FY89, and 4 facilities in both fiscal years. Thus, while overall costs per AWU did not change more than 3 percent between FY88 and FY89 over all Navy CONUS facilities, 12 of 21 facilities had greater than a 25 percent difference between observed and modeled expenses in either FY88 or FY89.

Estimates at Air Force MTFs were less variable. Only 5 of 60 facilities had greater than a 25 percent difference between modeled and observed expenses in FY88. In FY89, 5 different facilities had differences greater than 25 percent, and no Air Force facility had more than a 25 percent difference in both FY88 and FY89. Overall, there was a 7 percent increase in the cost per AWU at Air Force CONUS facilities and 13 facilities reported more than a 20 percent change in costs per AWU.

EXHIBIT 5-9: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS AMBULATORY EXPENSES

DMS ID	FACILITY	FY88 AMUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY89 AMUs	FY89 MODELED AMBULATORY EXPENSES	FY89 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AMU	FY89 OBSERVED EXPENSE/AMU	RATIO
1	FOX AH-REDSTONE ARSENAL	3,388	\$6,806,133	\$8,700,330	0.99	3,770	\$7,291,177	\$8,381,519	0.87	\$1,989	\$2,223	1.12
2	NOBLE AH-FT MCCELLELLAN	4,943	\$9,292,982	\$9,276,946	1.00	5,009	\$9,405,626	\$10,431,149	0.90	\$1,877	\$2,082	1.11
3	LYSTER AH-FT RUCKER	5,619	\$10,448,838	\$12,352,504	0.85	5,671	\$10,535,380	\$12,679,928	0.83	\$2,198	\$2,236	1.02
5	BASSETT ACH-FT WAINWRIGHT	5,011	\$9,409,039	\$11,587,443	0.81	5,056	\$9,485,835	\$11,299,021	0.84	\$2,308	\$2,235	0.97
8	BLISS AH-FT HUACHUCA	4,945	\$9,298,405	\$10,247,078	0.91	4,768	\$9,984,341	\$9,582,883	0.94	\$2,072	\$2,012	0.97
23	HAYS AH-FT ORD	12,180	\$21,824,717	\$24,418,217	0.89	11,078	\$19,759,428	\$23,642,971	0.84	\$2,007	\$2,135	1.06
32	EVANS AH-FT CARSON	11,221	\$20,006,882	\$20,772,416	0.96	12,493	\$22,177,648	\$24,012,888	0.92	\$1,851	\$1,922	1.04
48	MARTIN AH-FT BENNING	17,382	\$30,521,103	\$27,081,117	1.13	15,694	\$27,840,401	\$28,039,350	0.99	\$1,558	\$1,787	1.15
49	WINN AH-FT STEWART	8,765	\$15,815,529	\$17,921,304	0.88	8,412	\$15,213,107	\$18,771,626	0.81	\$2,045	\$2,232	1.09
57	IRWIN AH-FT RILEY	10,152	\$18,182,551	\$17,806,302	1.02	10,429	\$18,655,273	\$29,372,729	0.64	\$1,754	\$2,816	1.61
58	MUNSON AH-FT LEAVENWORTH	4,966	\$9,332,243	\$8,914,239	1.05	5,101	\$9,582,631	\$9,588,017	1.00	\$1,795	\$1,880	1.05
60	BLANCHFIELD ACH-FT CAMPBELL	14,825	\$25,816,070	\$24,029,882	1.07	14,514	\$25,628,640	\$24,000,309	1.07	\$1,643	\$1,654	1.01
61	IRELAND AH-FT KNOX	13,943	\$24,652,165	\$19,787,836	1.25	14,475	\$26,560,084	\$20,909,872	1.22	\$1,418	\$1,445	1.02
64	BAYNE-JONES AH-FT POLK	7,886	\$14,320,587	\$15,519,090	0.92	8,221	\$14,887,151	\$16,352,937	0.91	\$1,967	\$1,989	1.01
69	KIMBROUGH AH-FT MEADE	12,578	\$22,322,707	\$23,126,477	0.97	12,387	\$21,996,751	\$28,190,460	0.75	\$1,839	\$2,357	1.28
70	CUTLER AH-FT DEVENS	4,835	\$9,108,681	\$9,404,773	0.97	4,670	\$8,827,096	\$9,937,775	0.89	\$1,945	\$2,128	1.09
75	WOOD AH-FT LEONARD WOOD	10,794	\$19,278,174	\$21,918,107	0.88	12,081	\$21,474,538	\$23,987,988	0.90	\$2,031	\$1,986	0.98
81	PATTERSON AH-FT MONMOUTH	4,081	\$7,821,922	\$11,038,104	0.71	3,831	\$7,395,278	\$9,457,340	0.78	\$2,705	\$2,469	0.91
82	WALSON AH-FT DIX	10,046	\$17,999,847	\$20,489,261	0.88	9,362	\$18,834,355	\$18,956,476	0.89	\$2,038	\$2,025	0.99
88	KELLER AH-FT WEST POINT	4,398	\$8,359,494	\$9,558,684	0.88	4,288	\$8,171,771	\$9,888,075	0.83	\$1,947	\$2,307	1.18
89	WOMACK AH-FT BRAGG	22,962	\$40,043,803	\$31,068,870	1.29	21,775	\$38,018,096	\$30,324,998	1.25	\$1,353	\$1,393	1.03
98	REYNOLDS AH-FT SILL	11,527	\$20,529,095	\$19,700,007	1.04	11,017	\$19,658,740	\$21,450,224	0.92	\$1,709	\$1,947	1.14
105	MONCRIEF AH-FT JACKSON	10,286	\$18,411,233	\$18,095,520	1.02	9,867	\$17,696,177	\$18,173,498	0.97	\$1,759	\$1,842	1.05
110	DARNALL AH-FT HOOD	17,980	\$31,541,836	\$30,879,431	1.02	17,902	\$31,408,523	\$33,283,858	0.94	\$1,717	\$1,859	1.08
121	MCDONALD AH-FT EUSTIS	7,584	\$13,800,661	\$12,360,614	1.12	7,135	\$13,033,808	\$12,290,019	1.06	\$1,630	\$1,722	1.06
122	KENNER AH-FT LEE	5,985	\$11,071,245	\$11,218,088	0.99	5,551	\$10,330,590	\$12,177,918	0.85	\$1,874	\$2,194	1.17
123	DEWITT AH-FT BELVOIR	10,452	\$18,694,524	\$17,500,234	1.07	9,975	\$17,880,487	\$19,802,219	0.91	\$1,674	\$1,974	1.18
131	WEED ACH-FT IRWIN	2,244	\$4,886,940	\$6,093,586	0.77	2,502	\$5,127,237	\$7,788,362	0.66	\$2,716	\$3,113	1.15
294	HAWLEY AH-FT B. HARRISON	2,816	\$5,863,102	\$5,752,504	0.98	2,798	\$5,632,384	\$5,972,584	0.94	\$2,043	\$2,135	1.04
	ARMY CONUS HOSPITALS	263,593	\$474,854,818	\$473,537,985	1.00	259,828	\$468,280,553	\$508,646,773	0.92	\$1,797	\$1,961	1.09
7	BRH NAVSTA ADAK	756	\$2,935,947	\$2,512,503	1.17	1,008	\$3,523,883	\$1,481,831	2.41	\$3,323	\$1,450	0.44
24	NH CAMP PENDLETON	9,056	\$22,300,527	\$23,275,675	0.96	9,018	\$22,211,870	\$24,361,179	0.91	\$2,570	\$2,701	1.05
25	NH LONG BEACH	6,342	\$15,988,543	\$25,152,982	0.63	6,519	\$16,381,498	\$25,299,578	0.65	\$3,966	\$3,881	0.98
28	NH LEMOORE	2,802	\$7,849,417	\$8,074,895	1.29	2,746	\$7,578,780	\$7,217,822	1.07	\$2,123	\$2,264	1.07
30	BRH MAGAGC TWENTY NINE PALMS	2,346	\$6,846,547	\$3,943,211	1.69	2,533	\$7,081,833	\$5,688,895	1.24	\$1,681	\$2,250	1.34
35	NH GROTON	4,424	\$11,493,891	\$13,669,447	0.84	4,422	\$11,489,025	\$15,745,539	0.73	\$3,090	\$3,561	1.15
38	NH PENSACOLA	9,909	\$24,290,846	\$25,031,308	0.97	10,385	\$25,401,193	\$26,748,912	0.95	\$2,528	\$2,576	1.02
39	NH JACKSONVILLE	12,627	\$30,631,963	\$33,272,850	0.92	12,912	\$31,296,891	\$38,768,335	0.85	\$2,635	\$2,848	1.08
40	NH ORLANDO	8,972	\$22,104,548	\$20,812,372	1.06	9,555	\$23,484,735	\$22,535,485	1.04	\$2,320	\$2,359	1.02
56	NH GREAT LAKES	14,577	\$35,181,473	\$29,845,903	1.18	15,101	\$36,404,008	\$28,988,099	1.26	\$2,047	\$1,920	0.94
68	NH PATUXENT RIVER	1,887	\$5,574,962	\$3,827,586	1.54	2,034	\$5,917,625	\$5,513,228	1.07	\$1,922	\$2,711	1.41
91	NH CAMP LEJEUNE	7,847	\$19,479,831	\$18,614,311	1.05	9,203	\$22,643,490	\$20,590,569	1.10	\$2,372	\$2,237	0.94
92	NH CHERRY POINT	3,996	\$10,499,798	\$7,433,065	1.41	4,235	\$11,052,739	\$8,328,415	1.33	\$1,859	\$1,967	1.06

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EXHIBIT 5-9: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS AMBULATORY EXPENSES (CONTINUED)

DMIS ID	FACILITY	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY88 OBSERVED EXPENSE/AWU	RATIO
98	NH PHILADELPHIA	4,310	\$11,227,720	\$13,180,738	0.85	4,531	\$11,743,331	\$12,942,446	0.91	\$3,058	\$2,856	0.93
100	NH NEWPORT	3,084	\$8,367,361	\$12,194,833	0.69	2,898	\$7,933,408	\$11,371,033	0.70	\$3,954	\$3,924	0.99
103	NH CHARLESTON	8,300	\$20,746,895	\$19,688,599	1.05	8,341	\$20,832,374	\$22,904,068	0.90	\$2,347	\$2,746	1.17
104	NH BEAUFORT	6,528	\$16,397,830	\$13,493,948	1.22	6,514	\$16,389,833	\$15,763,101	1.04	\$2,068	\$2,420	1.17
107	NH MILLINGTON	4,994	\$12,823,548	\$13,516,236	0.95	4,777	\$12,317,269	\$15,781,140	0.78	\$2,706	\$3,304	1.22
116	NH CORPUS CHRISTI	3,436	\$9,188,606	\$11,896,201	0.77	3,413	\$9,134,945	\$13,648,883	0.67	\$3,462	\$3,999	1.16
126	NH BREMERTON	5,588	\$14,204,733	\$13,535,228	1.05	6,765	\$16,955,436	\$12,862,121	1.32	\$2,423	\$1,901	0.78
127	NH OAK HARBOR	2,363	\$6,885,209	\$4,530,268	1.48	2,792	\$7,886,101	\$4,476,897	1.72	\$1,917	\$1,603	0.84
	NAVY CONUS HOSPITALS	124,292	\$314,598,296	\$315,302,137	1.00	126,702	\$327,220,269	\$338,017,346	0.97	\$2,537	\$2,606	1.03
4	AIR UNIVERSITY RGN HOSP MAXWELL	5,662	\$11,653,816	\$11,464,382	1.02	5,466	\$11,283,084	\$7,510,112	1.50	\$2,025	\$1,374	0.68
6	USAF HOSP ELMENDORF	6,006	\$12,303,938	\$13,756,922	0.89	5,692	\$11,710,330	\$14,916,835	0.79	\$2,291	\$2,621	1.14
9	832nd MED GRP LUKE	5,963	\$12,260,458	\$11,421,276	1.07	5,964	\$12,224,539	\$12,576,843	0.97	\$1,909	\$2,109	1.10
10	838th MED GRP DAVIS MONTHAN	5,836	\$11,604,464	\$13,291,331	0.87	5,413	\$11,182,889	\$13,487,716	0.83	\$2,358	\$2,492	1.06
11	USAF HOSP WILLIAMS	2,853	\$6,343,283	\$8,694,706	0.73	2,757	\$6,161,798	\$7,337,026	0.84	\$3,048	\$2,661	0.87
12	97th STRAT HOSP EAKER	2,206	\$5,120,149	\$4,931,665	1.04	2,196	\$5,101,244	\$5,253,052	0.97	\$2,236	\$2,392	1.07
13	USAF HOSP LITTLE ROCK	3,822	\$7,797,055	\$8,107,104	0.96	4,000	\$8,511,854	\$8,867,512	0.96	\$2,238	\$2,217	0.99
15	9th STRAT HOSP BEALE	2,568	\$5,800,718	\$6,790,805	0.85	2,516	\$5,708,195	\$6,541,412	0.87	\$2,646	\$2,600	0.98
16	USAF HOSP MATHER	4,976	\$10,358,753	\$11,168,173	0.93	4,663	\$9,765,036	\$11,049,438	0.88	\$2,244	\$2,370	1.06
17	93rd STRAT HOSP CASTLE	3,939	\$8,396,335	\$6,994,856	1.20	3,543	\$7,847,708	\$7,059,711	1.08	\$1,776	\$1,993	1.12
18	1st STRAT HOSP VANDENBERG	3,286	\$7,161,857	\$7,369,928	0.97	3,252	\$7,097,581	\$7,611,147	0.93	\$2,243	\$2,340	1.04
19	USAF HOSP EDWARDS	2,895	\$6,044,589	\$5,855,357	1.03	2,864	\$6,364,078	\$4,500,609	1.41	\$2,173	\$1,571	0.72
20	831st MED GRP GEORGE	3,290	\$7,169,419	\$6,283,681	1.14	3,319	\$7,224,243	\$6,726,371	1.07	\$1,910	\$2,027	1.06
21	22nd STRAT HOSP MARCH	5,892	\$12,088,425	\$12,366,316	0.98	5,142	\$10,670,571	\$12,996,409	0.82	\$2,099	\$2,528	1.20
33	USAF ACADEMY HOSP	7,123	\$14,415,594	\$15,368,846	0.94	6,837	\$13,874,920	\$16,841,861	0.82	\$2,158	\$2,463	1.14
36	USAF HOSP DOVER	3,331	\$7,246,928	\$6,618,657	1.10	3,092	\$6,795,106	\$7,972,187	0.85	\$1,988	\$2,578	1.30
42	USAF RGN HOSP EGLIN	10,122	\$20,085,117	\$21,104,488	0.95	9,156	\$18,258,922	\$22,938,945	0.80	\$2,085	\$2,505	1.20
43	325th MED GRP TYNDALL	3,482	\$7,532,390	\$9,482,770	0.80	3,632	\$7,815,960	\$10,542,530	0.74	\$2,718	\$2,903	1.07
44	31st MED GRP HOMESTEAD	5,474	\$11,298,208	\$10,758,200	1.05	5,496	\$11,339,798	\$11,073,448	1.02	\$1,965	\$2,015	1.03
45	58th MED GRP MACDILL	6,967	\$14,120,681	\$13,842,779	1.04	6,852	\$13,903,277	\$15,375,853	0.90	\$1,958	\$2,244	1.15
46	USAF HOSP PATRICK	3,331	\$7,246,928	\$9,295,924	0.78	3,247	\$7,088,129	\$8,641,035	0.82	\$2,791	\$2,661	0.95
50	347th MED GRP MOODY	2,665	\$5,987,875	\$6,039,627	0.99	2,605	\$5,874,446	\$7,164,504	0.82	\$2,266	\$2,750	1.21
51	USAF HOSP ROBINS	3,398	\$7,373,590	\$7,994,897	0.92	3,094	\$6,798,887	\$7,274,710	0.93	\$2,353	\$2,351	1.00
53	368th MED GRP MOUNTAIN HOME	2,686	\$6,027,575	\$5,124,413	1.18	2,414	\$5,513,367	\$5,990,928	0.92	\$1,908	\$2,482	1.30
54	USAF HOSP CHANUTE	3,613	\$7,780,041	\$6,620,904	1.18	3,367	\$7,314,985	\$7,227,473	1.01	\$1,833	\$2,147	1.17
59	384th STRAT HOSP MCCONNELL	1,678	\$4,118,199	\$5,151,809	0.80	1,913	\$4,566,241	\$5,602,144	0.82	\$3,074	\$3,928	0.95
62	2nd STRAT HOSP BARKSDALE	5,473	\$11,298,317	\$9,612,591	1.18	5,055	\$10,506,100	\$9,705,741	1.08	\$1,756	\$1,920	1.09
83	23rd MED GRP ENGLAND	2,581	\$5,791,268	\$5,951,436	0.97	2,484	\$5,845,699	\$6,597,112	0.86	\$2,324	\$2,658	1.14
85	42nd STRAT HOSP LORING	1,831	\$4,411,222	\$3,784,206	1.17	1,675	\$4,116,308	\$4,418,159	0.93	\$2,067	\$2,638	1.28
71	379th STRAT HOSP WURTSMITH	2,246	\$5,195,767	\$5,163,137	1.01	1,984	\$4,662,655	\$4,909,026	0.95	\$2,299	\$2,500	1.09
72	410th STRAT HOSP A.I. SAWYER	2,253	\$5,209,001	\$5,232,228	1.00	2,200	\$5,108,808	\$5,487,530	0.93	\$2,322	\$2,494	1.07
74	USAF HOSP COLUMBUS	1,671	\$4,108,747	\$4,519,861	0.91	1,486	\$3,759,009	\$4,419,205	0.85	\$2,705	\$2,974	1.10
76	351st STRAT HOSP WHITEMAN	2,212	\$5,131,491	\$4,874,245	1.05	2,352	\$5,396,157	\$5,178,615	1.04	\$2,191	\$2,202	1.00
77	341st STRAT HOSP MALMSTROM	2,485	\$7,320,657	\$6,823,523	1.07	2,352	\$5,396,157	\$5,178,615	1.04	\$2,191	\$2,202	1.00
78	EHRLING BERQUIST RGN HOSP OFFUTT	8,144	\$16,345,765	\$14,911,527	1.10	7,533	\$15,190,688	\$15,590,357	0.97	\$1,831	\$2,070	1.13

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**EXHIBIT 5-9: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS AMBULATORY EXPENSES
(CONCLUDED)**

OMIS ID	FACILITY	FY88 AWUs	FY88 AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY89 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY89 OBSERVED EXPENSE/AWU	RATIO
79	554th MED GRP-NELLIS	5,049	\$10,494,758	\$9,907,588	1.06	5,603	\$11,542,079	\$11,468,785	1.01	\$1,962	\$2,047	1.04
80	509th STRAT HOSP-PEASE	3,510	\$7,586,323	\$8,473,135	0.90	3,531	\$7,825,023	\$8,336,253	0.91	\$2,414	\$2,361	0.98
83	USAF HOSP KIRTLAND	4,414	\$9,294,309	\$10,157,676	0.92	4,486	\$9,430,422	\$9,467,621	1.00	\$2,301	\$2,110	0.92
84	833rd MED GRP-HOLLOMAN	3,453	\$7,477,566	\$6,410,420	1.17	3,305	\$7,197,776	\$6,438,000	1.12	\$1,856	\$1,948	1.05
85	27th MED GRP-CANNON	2,414	\$5,513,367	\$5,499,587	1.00	2,258	\$5,218,453	\$5,287,358	0.99	\$2,278	\$2,342	1.03
87	380th STRAT HOSP-PLATTSBURGH	2,242	\$5,186,205	\$5,452,513	0.95	2,066	\$4,855,483	\$5,447,961	0.89	\$2,432	\$2,637	1.08
88	416th STRAT HOSP-GRIFFISS	2,903	\$6,437,807	\$6,081,996	1.06	2,760	\$6,167,469	\$6,815,030	0.90	\$2,095	\$2,469	1.18
90	4th MED GRP-SEYMOUR JOHNSON	3,134	\$6,874,506	\$6,045,521	1.14	3,237	\$7,069,224	\$7,555,424	0.94	\$1,929	\$2,334	1.21
93	842nd STRAT HOSP-GRAND FORKS	3,353	\$7,286,519	\$6,704,453	1.28	2,951	\$6,528,549	\$5,756,957	1.13	\$1,701	\$1,951	1.15
94	857th STRAT HOSP-MINOT	3,436	\$7,446,428	\$6,338,071	1.17	3,334	\$7,252,600	\$6,812,225	1.10	\$1,845	\$1,983	1.08
96	USAF HOSP TINKER	5,570	\$11,479,693	\$9,205,582	1.25	5,430	\$11,215,027	\$6,146,383	1.82	\$1,132	\$1,132	0.68
97	USAF HOSP ALTUS	2,166	\$5,044,530	\$4,731,752	1.07	1,940	\$4,617,283	\$5,241,737	0.88	\$2,185	\$2,702	1.24
101	363rd MED GRP-SHAW	3,948	\$8,413,349	\$12,017,736	0.70	3,685	\$7,916,155	\$8,748,898	0.90	\$3,044	\$2,374	0.78
102	354th MED GRP-MYRTLE BEACH	2,585	\$5,836,837	\$6,812,537	1.00	2,357	\$5,405,610	\$5,964,490	0.91	\$2,249	\$2,531	1.13
105	44th STRAT HOSP-ELLSWORTH	3,907	\$8,335,840	\$6,629,225	1.26	3,699	\$7,942,822	\$6,825,437	1.16	\$1,697	\$1,845	1.09
111	USAF HOSP REESE	1,770	\$4,295,903	\$4,000,829	1.07	1,600	\$3,974,523	\$4,140,742	0.96	\$2,260	\$2,588	1.14
112	96th STRAT HOSP-DYESS	4,000	\$8,511,654	\$7,609,916	1.12	3,522	\$7,608,008	\$7,546,681	1.01	\$1,902	\$2,143	1.13
113	USAF RGN HOSP SHEPPARD	6,077	\$12,438,162	\$12,466,206	1.00	5,425	\$11,205,575	\$12,277,876	0.91	\$2,051	\$2,263	1.10
114	USAF HOSP LAUGHLIN	1,731	\$4,222,175	\$3,188,395	1.33	1,587	\$3,912,138	\$4,057,351	0.96	\$1,841	\$2,589	1.41
115	67th MED GRP-BERGSTROM	3,857	\$7,863,222	\$8,579,946	0.92	3,396	\$7,373,590	\$9,681,925	0.76	\$2,346	\$2,849	1.21
116	R. THOMPSON STRAT HOSP-CARSWELL	8,342	\$16,720,079	\$20,188,155	0.83	7,893	\$15,871,257	\$21,235,365	0.75	\$2,420	\$2,690	1.11
119	USAF HOSP HILL	3,962	\$8,439,816	\$7,043,668	1.20	3,903	\$8,328,278	\$8,327,791	1.00	\$1,778	\$2,134	1.20
120	1st MED GRP-LANGLEY	7,261	\$14,676,479	\$13,809,115	1.06	7,050	\$14,277,590	\$14,084,184	1.01	\$1,902	\$1,998	1.05
128	92nd STRAT HOSP-FAIRCHILD	4,193	\$8,876,514	\$8,148,833	1.09	4,057	\$8,619,410	\$8,624,908	1.00	\$1,943	\$2,126	1.09
129	90th STRAT HOSP-F.E. WARREN	2,580	\$5,827,185	\$6,221,810	0.94	2,399	\$5,485,009	\$4,968,520	1.10	\$2,412	\$2,071	0.86
	USAF CONUS HOSPITALS	237,013	\$506,725,441	\$506,273,055	1.00	224,697	\$480,819,564	\$510,443,456	0.94	\$2,130	\$2,272	1.07

NOTE: Expenses and workload within the PRIMUS/NAVCARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

5.3 OVERSEAS HOSPITALS

Detailed results from overseas hospital expense models are presented in this section. It consists of three subsections: Inpatient Nonclinician Expenses, Inpatient Clinician Expenses, and Ambulatory Expenses.

Inpatient Nonclinician Expenses

Estimates of FY88 and FY89 overseas hospital nonclinician expenses were generally good predictions of observed expenses for the Army and Navy. Modeled and observed expenses for both years are displayed in exhibit 5-10. In FY88, 67th Evacuation Hospital-Wurzburg (DMIS ID 609) and 45th Field Hospital-Vicenza (DMIS ID 611) were the only Army overseas MTFs with greater than a 25 percent difference between observed and estimated expenses. There appears to be a data reporting problem at Wurzburg as expenses per IWU increased by 80 percent from FY88 to FY89 and the FY89 estimate was within 5 percent of observed expenses. Vicenza is roughly 25 percent more costly than estimated for both fiscal years. Overall for Army overseas hospitals there was a 16 percent increase in nonclinician expenses per IWU and this increase caused estimates at some facilities to be significantly lower than observed expenses in FY89.

The Navy had two facilities in FY88 with modeled expenses substantially different from observed expenses - NH Subic Bay (DMIS ID 619) and NH Roosevelt Roads-Ceiba (DMIS ID 616). Only NH Subic Bay had greater than a 25 percent difference in FY89. Interestingly, if the cost and workload data are accurate for NH Subic Bay, it would be one of the least expensive of all Navy hospitals in terms of cost per unit work. This pattern continues for clinician expenses and ambulatory expenses at NH Subic Bay as well.

EXHIBIT 5-10: MODELED AND OBSERVED OVERSEAS HOSPITALS NONCLINICIAN EXPENSES

DMIS ID	FACILITY	FY88 IMUs	FY88 MODELED NONCLINICIAN EXPENSES	FY88 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY89 IMUs	FY89 MODELED NONCLINICIAN EXPENSES	FY89 OBSERVED NONCLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IMU	FY89 OBSERVED EXPENSE/IMU	RATIO
601	34th GENERAL HOSP AUGSBURG	3,437	\$7,187,156	\$7,873,736	0.91	3,255	\$6,832,636	\$8,772,690	0.78	\$2,291	\$2,695	1.18
602	5th GENERAL HOSP-BAD CANNSTATT	6,311	\$12,785,446	\$12,915,597	0.99	6,026	\$12,230,292	\$13,755,374	0.89	\$2,047	\$2,283	1.12
603	AH-BERLIN	---	---	---	---	---	---	---	---	---	---	---
604	2nd FIELD HOSP-BREMERHAVEN	1,860	\$4,095,824	\$4,566,810	0.90	1,737	\$3,875,710	\$5,259,128	0.74	\$2,469	\$3,028	1.23
605	9th GENERAL HOSP-FRANKFURT	11,065	\$22,045,805	\$23,913,509	0.92	10,009	\$19,988,813	\$23,598,699	0.68	\$2,161	\$2,957	1.37
606	130th STATN HOSP-HEIDELBERG	4,683	\$9,614,250	\$9,866,280	0.97	3,903	\$8,094,881	\$10,787,581	0.75	\$2,107	\$2,764	1.31
607	2nd GENERAL HOSP-LANDSTUHL	13,169	\$26,144,206	\$26,575,493	0.98	12,364	\$24,576,139	\$24,758,372	0.99	\$2,018	\$2,002	0.99
608	90th GENERAL HOSP-NURNBERG	7,065	\$14,234,690	\$16,122,578	0.88	6,960	\$14,049,639	\$15,004,152	0.94	\$2,285	\$2,156	0.94
609	87th EVACUATION HOSP-WURZBURG	4,019	\$8,320,838	\$4,891,058	1.70	3,857	\$8,005,277	\$8,457,844	0.95	\$1,217	\$2,193	1.80
611	45th FIELD HOSP-VIGENZA	1,140	\$2,712,808	\$3,659,034	0.74	922	\$2,288,164	\$3,151,028	0.73	\$3,210	\$3,418	1.06
612	121st EVACUATION HOSP-SEOUL	7,402	\$14,910,615	\$14,015,138	1.06	6,521	\$13,194,507	\$14,274,547	0.92	\$1,893	\$2,189	1.16
613	GORGAS ACH	7,494	\$15,089,822	\$12,810,422	1.20	7,277	\$14,667,126	\$13,243,644	1.11	\$1,683	\$1,820	1.08
614	198th STAT HOSP-SHAPE	---	---	---	---	---	---	---	---	---	---	---
615	ARMY OVERSEAS HOSPITALS	87,825	\$137,141,450	\$137,009,655	1.00	82,831	\$127,803,183	\$147,062,858	0.87	\$2,026	\$2,341	1.16
616	NH GUANTANAMO BAY	995	\$2,779,313	\$2,528,104	1.10	982	\$2,750,354	\$2,701,585	1.02	\$2,541	\$2,751	1.08
617	NH ROOSEVELT ROADS-CEIBA	1,863	\$4,267,343	\$6,433,493	0.66	1,814	\$4,603,709	\$6,725,142	0.80	\$3,869	\$3,156	0.82
618	NH NAPLES	1,755	\$4,280,281	\$4,290,370	1.04	1,954	\$4,915,572	\$4,413,480	1.11	\$2,445	\$2,259	0.92
619	NH ROTA	1,302	\$3,463,183	\$3,506,322	0.99	1,362	\$3,596,839	\$4,151,601	0.87	\$2,693	\$3,048	1.13
620	NH SUBIC BAY	3,566	\$8,506,447	\$5,809,287	1.46	3,588	\$8,555,454	\$6,464,184	1.32	\$1,629	\$1,802	1.11
621	NH GUAM-AGANA	3,351	\$8,027,515	\$8,715,952	0.92	3,579	\$8,535,406	\$9,971,818	0.86	\$2,601	\$2,786	1.07
622	NH OKINAWA	6,346	\$14,698,147	\$15,262,099	0.96	5,570	\$12,970,537	\$14,863,074	0.87	\$2,405	\$2,668	1.11
623	NH YOKOSUKA	3,581	\$8,539,861	\$8,110,131	1.05	3,524	\$8,412,888	\$9,623,033	0.98	\$2,265	\$2,447	1.08
623	NH KEFLAIRK	---	---	---	---	---	---	---	---	---	---	---
624	NAVY OVERSEAS HOSPITALS	22,559	\$54,755,091	\$54,855,758	1.00	22,373	\$54,340,759	\$56,913,917	0.95	\$2,423	\$2,544	1.05
626	USAF HOSP BITBURG	1,848	\$3,710,989	\$3,204,359	1.16	1,205	\$2,575,086	\$3,324,047	0.77	\$1,734	\$2,759	1.59
627	USAF HOSP HAHN	1,459	\$3,023,794	\$2,532,999	1.19	1,218	\$2,598,051	\$2,453,638	1.06	\$1,736	\$2,014	1.16
628	USAF RGN MED CTR WIESBADEN	8,574	\$15,592,926	\$15,551,855	1.00	8,282	\$15,077,088	\$13,405,984	1.12	\$1,814	\$1,619	0.89
629	USAF HOSP LAJES	511	\$1,349,088	\$1,792,398	0.75	498	\$1,326,122	\$2,107,259	0.63	\$3,508	\$4,231	1.21
630	USAF HOSP TORREJON	2,037	\$4,044,870	\$3,702,552	1.09	1,485	\$3,069,725	\$3,757,798	0.82	\$1,818	\$2,531	1.39
631	USAF HOSP HELLENKON	414	\$1,177,731	\$871,293	1.35	317	\$1,006,374	\$747,705	1.35	\$1,621	\$2,359	1.45
632	USAF HOSP UPPER HEYFORD	2,120	\$4,191,496	\$5,384,248	0.78	1,883	\$3,772,819	\$4,085,858	0.93	\$2,540	\$2,159	0.85
633	USAF RGN HOSP LAKENHEATH	3,834	\$7,219,393	\$6,017,734	1.20	3,779	\$7,122,232	\$7,385,536	0.96	\$1,570	\$1,954	1.25
634	USAF HOSP IRAKLION	127	\$670,726	\$531,731	1.26	205	\$808,518	\$582,070	1.44	\$4,187	\$2,742	0.65
635	USAF HOSP INCIRLIK	1,214	\$2,590,987	\$3,110,426	0.83	1,228	\$2,615,717	\$2,429,034	1.08	\$2,562	\$1,978	0.77
636	13th MED CENTER-CLARK AB	9,289	\$18,856,022	\$16,832,881	1.00	9,405	\$17,080,944	\$17,608,780	0.97	\$1,812	\$1,872	1.03
637	8th MED GRP-KUNSON AB	333	\$1,034,839	\$789,986	1.31	266	\$916,279	\$598,847	1.53	\$2,372	\$2,251	0.95
638	51st MED GRP-OSAN AB	1,457	\$3,020,261	\$2,098,531	1.44	962	\$2,145,810	\$2,054,166	1.04	\$1,440	\$2,135	1.48
639	432nd MED GRP-MISAWA	1,199	\$2,584,487	\$4,028,881	0.64	1,285	\$2,716,411	\$4,418,386	1.12	\$3,359	\$1,882	0.56
640	475th MED GRP-YOKOTA AB	1,703	\$3,454,837	\$4,526,008	0.76	1,588	\$3,216,350	\$4,647,079	0.69	\$2,658	\$2,964	1.12
640	USAF OVERSEAS HOSPITALS	36,119	\$70,502,242	\$70,773,892	1.00	33,586	\$66,027,525	\$67,564,187	0.98	\$1,959	\$2,012	1.03

Within the Air Force, there were 5 of 15 facilities with a difference between modeled and observed expenses in FY88 greater than 25 percent, and 5 facilities with substantial differences in FY89. Three facilities, USAF Hospital Hellenikon (DMIS ID 631), USAF Hospital Iraklion (DMIS ID 634), and 8th Medical Group-Kunson (DMIS ID 637) had overestimated expenses in both FY88 and FY89. Additionally, 8 facilities reported greater than 20 percent changes in cost per work unit while the overall increase in cost per IWU for overseas Air Force facilities was roughly 3 percent.

Inpatient Clinician Expenses

Estimated and observed inpatient clinician expenses for overseas facilities are presented in exhibit 5-11. As with estimates of clinician expenses at CONUS community hospitals, it appears data reporting problems, accounting methods, or missing information preclude accurate estimates of clinician expenses at overseas hospitals. This is particularly true for Navy and Air Force MTFs where 7 of 8 Navy facilities and 12 of 15 Air Force MTFs had greater than 25 percent differences between observed and modeled expenses in either FY88 or FY89. Note the substantial changes in unit costs at many Navy and USAF overseas hospitals. Estimates for Army facilities were relatively more accurate for both fiscal years.

Ambulatory Expenses

Estimates of ambulatory expenses, shown in exhibit 5-12, were relatively accurate at overseas facilities for the Army and Navy. Wurzburg and Vicenza were the only Army facilities with significant differences between modeled and observed expenses in FY88 and estimates were within 20 percent of observed expenses in FY89 for both facilities. No Army

EXHIBIT 5-11: MODELED AND OBSERVED OVERSEAS HOSPITALS CLINICIAN EXPENSES

DMIS ID	FACILITY	FY88 IWUE	FY88 MODELED CLINICIAN EXPENSES	FY88 OBSERVED CLINICIAN EXPENSES	RATIO	FY89 IWUE	FY89 MODELED CLINICIAN EXPENSES	FY89 OBSERVED CLINICIAN EXPENSES	RATIO	FY88 OBSERVED EXPENSE/IWUE	FY89 OBSERVED EXPENSE/IWUE	RATIO
601	34th GENERAL HOSP-AUGSBURG	3,437	\$502,008	\$510,714	0.98	3,255	\$475,425	\$469,878	1.01	\$149	\$144	0.97
602	5th GENERAL HOSP-BAD CANNSTATT	6,311	\$921,785	\$790,317	1.17	6,026	\$880,158	\$1,085,443	0.83	\$125	\$177	1.41
603	AH-BERLIN	---	---	---	---	---	---	---	---	---	---	---
604	2nd FIELD HOSP-BREMERHAVEN	1,850	\$270,211	\$208,152	1.31	1,737	\$253,708	\$190,590	1.33	\$111	\$110	0.98
605	97th GENERAL HOSP-FRANKFURT	11,085	\$1,616,154	\$1,689,074	0.96	10,009	\$1,461,915	\$1,667,647	0.88	\$153	\$167	1.09
606	130th STATN HOSP-HEIDELBERG	4,883	\$683,999	\$735,209	0.93	3,903	\$570,072	\$571,924	1.00	\$157	\$147	0.93
607	12th GENERAL HOSP-LANDSTUHL	13,169	\$1,923,484	\$2,385,690	0.81	12,364	\$1,805,886	\$2,072,696	0.87	\$181	\$168	0.93
608	98th GENERAL HOSP-NURNBERG	7,055	\$1,030,453	\$945,420	1.09	6,960	\$1,018,578	\$732,251	1.39	\$134	\$105	0.79
609	87th EVACUATION HOSP-MURZBURG	4,019	\$587,015	\$534,795	1.10	3,857	\$563,353	\$478,550	1.18	\$133	\$124	0.93
611	46th FIELD HOSP-VICENZA	1,140	\$166,508	\$128,735	1.29	922	\$134,667	\$90,670	1.49	\$113	\$98	0.87
612	121st EVACUATION HOSP-SEOUL	7,402	\$1,081,136	\$902,024	1.20	6,521	\$952,457	\$988,778	0.96	\$122	\$152	1.24
613	GORGAS ACH	7,494	\$1,094,574	\$1,049,166	1.04	7,277	\$1,062,879	\$1,022,174	1.04	\$140	\$140	1.00
614	198th STAT HOSP-SHAPE	---	---	---	---	---	---	---	---	---	---	---
	ARMY OVERSEAS HOSPITALS	67,825	\$9,877,308	\$9,877,296	1.00	62,831	\$9,177,096	\$9,348,616	0.98	\$146	\$149	1.02
615	NH GUANTANAMO BAY	995	\$156,530	\$42,220	3.71	982	\$154,485	\$73,095	2.11	\$42	\$74	1.75
616	NH ROOSEVELT ROADS-CEIBA	1,663	\$261,618	\$222,175	1.18	1,814	\$285,373	\$199,147	1.43	\$134	\$110	0.82
617	NH NAPLES	1,755	\$276,091	\$954,585	0.29	1,954	\$307,397	\$384,602	0.80	\$544	\$197	0.36
618	NH ROTA	1,302	\$204,827	\$189,539	1.08	1,382	\$214,266	\$224,498	0.95	\$146	\$165	1.13
619	NH SUBIC BAY	3,568	\$560,992	\$381,729	1.47	3,588	\$564,453	\$357,443	1.58	\$107	\$100	0.93
620	NH GUAM-AGANA	3,351	\$527,169	\$491,732	1.07	3,579	\$563,038	\$626,207	0.68	\$147	\$231	1.57
621	NH OKINAWA	6,346	\$998,334	\$824,342	1.21	5,570	\$876,256	\$633,036	1.38	\$130	\$114	0.87
622	NH YOKOSUKA	3,581	\$563,352	\$442,665	1.27	3,524	\$554,385	\$318,011	1.74	\$124	\$90	0.73
623	NH KEELAIRK	---	---	---	---	---	---	---	---	---	---	---
	NAVY OVERSEAS HOSPITALS	22,559	\$3,548,914	\$3,548,930	1.00	27,373	\$3,519,653	\$3,016,039	1.17	\$157	\$135	0.86
626	USAF HOSP BITBURG	1,848	\$170,260	\$209,345	0.81	1,215	\$111,019	\$100,794	1.10	\$113	\$84	0.74
627	USAF HOSP HAHN	1,459	\$134,421	\$85,551	1.57	1,21	\$112,217	\$132,017	0.85	\$59	\$108	1.85
628	USAF RGN MED CTR WIESBADEN	8,574	\$789,940	\$1,092,167	0.72	8,24	\$783,037	\$962,885	0.77	\$127	\$120	0.94
629	USAF HOSP LAJES	511	\$47,079	\$41,220	1.14	45	\$45,882	\$47,347	0.97	\$81	\$95	1.18
630	USAF HOSP TORREJON	2,037	\$187,673	\$200,155	0.94	1,485	\$136,818	\$108,393	1.26	\$98	\$73	0.74
631	USAF HOSP HELLENIKON	414	\$38,143	\$26,014	1.47	317	\$29,206	\$8,442	3.46	\$63	\$27	0.42
632	USAF HOSP UPPER HEYFORD	2,120	\$195,320	\$168,237	1.17	1,893	\$173,485	\$235,383	0.74	\$78	\$125	1.59
633	USAF RGN HOSP LAKENHEATH	3,834	\$353,234	\$292,504	1.21	3,773	\$348,167	\$511,762	0.68	\$76	\$135	1.78
634	USAF HOSP IRAKLION	127	\$11,701	\$4,717	2.48	205	\$18,887	\$29,822	0.63	\$37	\$145	3.92
635	USAF HOSP INCIRLIK	1,214	\$111,848	\$79,984	1.40	1,228	\$113,138	\$100,187	1.13	\$66	\$82	1.24
636	13th MED CENTER-CLARK AB	9,289	\$855,814	\$743,858	1.15	9,405	\$896,501	\$883,685	1.00	\$92	\$92	1.15
637	8th MED GRP-KUNSON AB	333	\$30,680	\$1,708	17.96	266	\$24,507	\$14,375	1.70	\$5	\$54	10.54
638	51st MED GRP-OSAN AB	1,457	\$134,236	\$105,942	1.27	962	\$88,631	\$102,424	0.87	\$73	\$106	1.46
639	432nd MED GRP-MISAWA	1,199	\$110,468	\$81,171	1.36	1,285	\$118,390	\$85,852	1.80	\$68	\$51	0.76
640	475th MED GRP-YOKOTA AB	1,703	\$156,901	\$197,114	0.80	1,588	\$144,483	\$103,916	1.39	\$116	\$66	0.57
	USAF OVERSEAS HOSPITALS	36,119	\$3,327,716	\$3,327,693	1.00	33,586	\$3,094,345	\$3,417,294	0.91	\$92	\$102	1.10

EXHIBIT 5-12: MODELED AND OBSERVED OVERSEAS HOSPITALS AMBULATORY EXPENSES

DMIS ID	FACILITY	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY89 AWUs	FY89 MODELED AMBULATORY EXPENSES	FY89 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY89 OBSERVED EXPENSE/AWU	RATIO
601	34th GENERAL HOSP-AUGSBURG	5,250	\$12,127,734	\$12,919,604	0.94	5,482	\$12,580,413	\$14,313,674	0.88	\$2,461	\$2,611	1.06
602	5th GENERAL HOSP-BAD CANNSTATT	8,280	\$18,039,876	\$17,119,383	1.05	8,278	\$18,035,973	\$13,157,892	0.94	\$2,068	\$2,314	1.12
603	AH BERLIN	---	---	---	---	---	---	---	---	---	---	---
604	2nd FIELD HOSP-BREMERHAVEN	2,932	\$7,604,847	\$6,989,292	1.09	2,978	\$7,694,603	\$7,667,427	1.00	\$2,384	\$2,575	1.08
605	9th GENERAL HOSP-FRANKFURT	18,578	\$38,133,354	\$36,985,959	1.03	18,236	\$33,563,639	\$47,011,264	0.71	\$1,990	\$2,895	1.46
606	130th STATN HOSP-HEIDELBERG	8,627	\$18,716,943	\$18,379,196	1.14	8,467	\$18,404,751	\$18,799,620	0.98	\$1,899	\$2,220	1.17
607	2nd GENERAL HOSP-LANDSTUHL	12,412	\$26,102,242	\$28,487,994	0.92	12,281	\$25,846,635	\$29,230,274	0.88	\$2,296	\$2,380	1.04
608	98th GENERAL HOSP-NURNBERG	11,864	\$25,013,472	\$28,767,047	0.93	12,134	\$25,559,908	\$25,493,722	1.00	\$2,258	\$2,101	0.93
609	6th EVACUATION HOSP-WURZBURG	7,765	\$17,035,007	\$9,543,995	1.78	7,919	\$17,335,492	\$15,650,591	1.11	\$1,229	\$1,976	1.61
611	46th FIELD HOSP-VIGENZA	1,992	\$5,770,718	\$9,448,329	0.61	1,928	\$5,645,841	\$6,699,137	0.84	\$4,743	\$3,475	0.73
612	121st EVACUATION HOSP-SEOUL	10,868	\$22,695,444	\$25,252,453	0.90	9,798	\$21,001,800	\$27,748,039	0.76	\$2,368	\$2,832	1.20
613	GORGAS ACH	7,054	\$15,647,702	\$16,037,202	0.98	6,453	\$14,475,030	\$16,830,593	0.86	\$2,273	\$2,608	1.15
614	198th STAT HOSP-SHAPE	---	---	---	---	---	---	---	---	---	---	---
615	ARMY OVERSEAS HOSPITALS	95,410	\$206,887,338	\$205,910,254	1.00	91,954	\$200,143,984	\$228,602,233	0.88	\$2,158	\$2,486	1.15
616	NH GUANTANAMO BAY	1,363	\$5,170,339	\$4,457,737	1.16	1,340	\$5,119,269	\$5,376,776	0.95	\$3,271	\$4,013	1.23
618	NH ROOSEVELT ROADS-CEIBA	2,134	\$6,882,299	\$7,098,428	0.97	2,166	\$6,953,363	\$7,033,717	0.99	\$3,326	\$3,247	0.98
617	NH NAPLES	2,841	\$8,452,151	\$10,670,888	0.79	3,048	\$8,911,782	\$10,986,891	0.81	\$3,756	\$3,598	0.96
618	NH ROTA	1,942	\$6,455,975	\$4,806,512	1.34	2,038	\$6,669,137	\$5,899,073	1.13	\$2,475	\$2,895	1.17
619	NH SUBIC BAY	4,666	\$12,504,456	\$8,259,163	1.51	4,258	\$11,598,516	\$9,471,323	1.22	\$1,770	\$2,224	1.26
620	NH GUAM-AGANA	3,781	\$10,539,366	\$9,322,103	1.13	3,491	\$9,895,438	\$11,223,699	0.88	\$2,466	\$3,215	1.30
621	NH OKINAWA	4,834	\$13,099,534	\$18,895,665	0.78	4,821	\$12,404,536	\$14,908,712	0.83	\$3,424	\$3,226	0.94
622	NH YOKOSUKA	4,903	\$13,090,700	\$15,130,003	0.86	5,399	\$14,132,039	\$14,340,634	0.99	\$3,086	\$2,656	0.86
623	NH KEFLAIRK	---	---	---	---	---	---	---	---	---	---	---
626	NAVY OVERSEAS HOSPITALS	26,564	\$76,134,820	\$76,640,499	0.99	26,361	\$75,684,071	\$79,220,825	0.96	\$2,885	\$3,005	1.04
627	USAF HOSP BITBURG	2,589	\$5,610,709	\$3,812,540	1.47	2,577	\$5,591,767	\$3,721,968	1.50	\$1,473	\$1,444	0.98
628	USAF HOSP HAHN	2,451	\$5,392,880	\$4,858,390	1.16	2,525	\$5,508,687	\$4,865,955	1.13	\$1,901	\$1,927	1.01
629	USAF RGN MED CTR WIESBADEN	5,478	\$10,170,914	\$12,801,446	0.79	5,334	\$9,943,615	\$11,082,700	0.90	\$2,337	\$2,078	0.89
630	USAF HOSP LAJES	858	\$2,875,217	\$2,308,814	1.25	928	\$2,988,867	\$2,724,305	1.10	\$2,697	\$2,936	1.09
631	USAF HOSP TORREJON	2,269	\$5,105,598	\$5,343,328	0.96	1,985	\$4,657,312	\$6,294,835	0.74	\$2,355	\$3,171	1.35
632	USAF HOSP HELLENKON	1,288	\$3,587,117	\$2,731,279	1.30	922	\$2,979,398	\$2,539,985	1.17	\$2,121	\$2,755	1.30
633	USAF HOSP UPPER HEYFORD	2,721	\$5,819,067	\$5,712,873	1.02	2,635	\$5,683,319	\$5,485,054	1.04	\$2,099	\$2,082	0.99
634	USAF RGN HOSP LAKENHEATH	4,458	\$9,560,873	\$6,353,416	1.35	4,005	\$7,845,825	\$8,473,961	0.93	\$1,425	\$2,116	1.48
635	USAF HOSP IRAKLION	462	\$2,253,299	\$1,734,286	1.30	454	\$2,240,671	\$1,425,209	1.57	\$3,754	\$3,139	0.84
636	USAF HOSP INCIRLIK	1,304	\$3,582,372	\$4,344,591	0.82	1,341	\$3,640,776	\$2,999,034	1.21	\$3,332	\$2,236	0.67
637	13th MED CENTER-CLARK AB	7,195	\$12,881,151	\$13,848,639	0.93	7,174	\$12,848,003	\$13,600,105	0.94	\$1,925	\$1,896	0.98
638	8th MED GRP-KUNSON AB	691	\$2,614,789	\$3,569,928	0.73	875	\$2,589,513	\$1,992,572	1.30	\$5,166	\$2,952	0.57
639	51st MED GRP-OSAN AB	2,053	\$4,784,648	\$5,709,859	0.83	1,946	\$4,595,751	\$5,554,221	0.83	\$2,781	\$2,854	1.03
640	432nd MED GRP-MSAWA	2,379	\$5,279,230	\$4,651,197	1.14	2,330	\$5,201,885	\$3,419,943	1.52	\$1,955	\$1,468	0.75
641	475th MED GRP-YOKOTA AB	2,481	\$5,440,234	\$6,823,870	0.80	2,459	\$5,405,508	\$7,562,252	0.71	\$2,750	\$3,075	1.12
642	USAF OVERSEAS HOSPITALS	38,675	\$83,908,078	\$84,404,256	0.99	37,290	\$81,721,804	\$81,742,099	1.00	\$2,182	\$2,192	1.00

NOTE: Expenses and workload within the PRIMUS/NAVCARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

facilities had a substantial difference between observed and modeled expenses in both FY88 and FY89. Within the Navy, only NH Subic Bay had greater than a 25 percent difference between observed and modeled expenses in both FY88 and FY89.

In contrast, estimates of ambulatory expenses at Air Force facilities were not as accurate. Of 15 overseas MTFs, 9 had greater than a 25 percent difference between observed and modeled expenses in either fiscal year. Additionally, 5 of the 15 MTFs reported 30 percent or greater changes in cost per AWU while overall there was approximately a 1 percent increase in cost per AWU for Air Force overseas facilities.

5.4 CLINICS

Ambulatory expenses and workload data for stand-alone clinics are presented in exhibit 5-13. Note, as with hospitals PRIMUS/NAVCARE and occupational health clinic expenses and workload were excluded prior to developing the model parameters and completing the data analysis. Additionally, data at NMCL San Diego (DMIS ID 701) and USAF Clinic Peterson (DMIS ID 252) were excluded prior to computing the model parameters leaving data from 53 clinics upon which the models were developed.

In FY88 there were 11 of these 53 facilities with greater than a 25 percent difference between modeled and observed expenses, 14 facilities in FY89, but only 6 facilities in both fiscal years. The table below summarizes the number of facilities with greater than a 25 percent difference between observed and estimated expenses, including the two facilities not modeled.

	<u>ARMY</u>		<u>NAVY</u>		<u>USAF</u>		<u>TOTAL</u>	
	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>	<u>FY88</u>	<u>FY89</u>
Facilities with >25% Difference	0	0	4	7	9	8	13	15
Facilities Estimated	2	2	13	13	40	40	55	55

EXHIBIT 5-13: MODELED AND OBSERVED CLINIC AMBULATORY EXPENSES

DMIS ID	FACILITY	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY88 OBSERVED RATIO
330	WILCOX AHC-FT DRUM	3,542	\$8,016,669	\$7,538,177	1.06	4,273	\$8,359,981	\$10,518,189	0.89	\$2,128	1.16
810	USAF SAGAMI-JAPAN	905	\$3,170,823	\$3,479,701	0.91	934	\$3,224,114	\$3,327,008	0.97	\$3,845	0.93
	ARMY CLINICS	4,447	\$11,187,492	\$11,017,878	1.02	5,207	\$12,554,095	\$13,845,185	0.91	\$2,478	1.07
26	MMCL PORT HUENEME	1,698	\$4,949,261	\$3,956,813	1.25	2,018	\$5,578,116	\$1,747,132	3.19	\$2,330	0.37
41	MMCL KEY WEST	905	\$3,390,881	\$3,955,079	0.86	917	\$3,414,463	\$4,006,939	0.85	\$4,370	1.00
280	MMCL PEARL HARBOR	6,366	\$14,122,875	\$10,905,579	1.29	8,163	\$13,723,745	\$12,364,825	1.11	\$2,006	1.07
297	MMCL NEW ORLEANS	1,183	\$3,897,895	\$4,957,219	0.79	1,136	\$3,844,838	\$5,168,116	0.74	\$4,282	1.07
308	MMCL ANNA POLIS	1,821	\$5,190,977	\$5,663,227	0.92	1,886	\$5,318,713	\$6,042,117	0.88	\$3,204	1.03
321	MMCL PORTSMOUTH	1,107	\$3,787,846	\$4,701,715	0.81	1,182	\$3,895,930	\$5,025,813	0.78	\$4,247	1.02
385	MMCL QUANTICO	6,293	\$13,979,217	\$11,110,896	1.26	2,608	\$8,733,635	\$11,340,548	0.59	\$1,766	2.46
398	MMCL SEATTLE	820	\$2,830,808	\$3,309,332	0.86	711	\$3,009,638	\$1,309,017	2.30	\$5,338	0.34
528	MMCL SAN FRANCISCO	4,274	\$10,011,539	\$10,974,501	0.91	4,873	\$10,795,642	\$11,302,418	0.96	\$2,568	0.94
701	MMCL SAN DIEGO	12,470	\$26,118,072	\$19,770,211	1.32	12,170	\$25,528,521	\$19,474,527	1.31	\$1,585	1.01
702	MMCL NORFOLK	9,185	\$19,962,489	\$20,258,294	0.97	10,011	\$21,285,719	\$23,858,340	0.89	\$2,206	1.08
703	MMCL WASHINGTON DC	1,707	\$4,988,948	\$5,470,050	0.91	1,594	\$4,744,883	\$921,377	5.15	\$3,204	0.18
8931	MMCL LONDON	776	\$3,137,374	\$2,884,238	1.08	777	\$3,139,340	\$2,022,808	1.55	\$3,730	0.70
	NAVY CLINICS	44,385	\$116,045,983	\$107,957,154	1.07	45,824	\$111,013,182	\$104,581,577	1.06	\$2,231	1.02
203	USAF CLINIC EIELSON	1,690	\$3,420,221	\$3,659,432	0.93	1,598	\$3,294,883	\$3,803,767	0.87	\$2,185	1.10
248	USAF CLINIC LOS ANGELES	856	\$2,284,003	\$1,947,436	1.17	880	\$2,316,700	\$2,763,577	0.84	\$2,275	1.38
249	USAF CLINIC NORTON	2,548	\$4,589,137	\$6,522,551	0.70	2,221	\$4,143,641	\$6,317,805	0.66	\$2,560	1.11
250	USAF CLINIC MCCLELLAN	2,218	\$4,139,554	\$5,233,767	0.79	2,286	\$4,232,195	\$5,023,594	0.84	\$2,360	0.93
251	USAF CLINIC LOWRY	1,367	\$2,980,175	\$2,748,439	1.08	978	\$2,450,213	\$2,185,023	1.12	\$2,011	1.11
252	USAF CLINIC PETERSON	2,687	\$4,751,259	\$1,784,517	2.69	2,584	\$4,638,182	\$5,936,953	0.78	\$662	3.47
287	15th MED GRP-HICKAM	2,664	\$4,747,172	\$5,982,590	0.79	2,433	\$4,432,464	\$6,386,571	0.69	\$2,246	1.17
293	305th STRAT HOSP-GRISCOM	1,562	\$3,245,938	\$4,307,880	0.75	1,480	\$3,106,878	\$4,387,258	0.71	\$2,758	1.09
310	USAF CLINIC HANSCOM	1,159	\$2,698,802	\$3,745,300	0.72	1,148	\$2,681,816	\$3,146,529	0.85	\$3,231	0.85
326	USAF CLINIC MCUGUIRE	1,266	\$2,942,578	\$2,888,105	0.98	1,202	\$2,755,384	\$2,745,708	1.00	\$2,289	1.00
335	USAF CLINIC POPE	1,488	\$3,145,022	\$3,495,844	0.90	1,254	\$2,828,227	\$3,637,431	0.78	\$2,349	1.23
338	USAF CLINIC VANCE	743	\$2,130,055	\$2,340,065	0.91	869	\$2,301,714	\$1,885,234	1.22	\$3,149	0.69
358	USAF CLINIC CHARLESTON	2,088	\$3,982,445	\$3,986,482	0.99	1,813	\$3,587,793	\$4,429,142	0.81	\$1,909	1.28
363	USAF CLINIC BROOKS	726	\$2,106,895	\$1,951,541	1.08	696	\$2,066,024	\$2,173,595	0.95	\$2,688	1.16
364	USAF CLINIC GOODFELLOW	1,376	\$2,992,437	\$3,175,399	0.94	1,291	\$2,878,635	\$3,058,437	0.94	\$2,308	1.03
385	USAF CLINIC KELLY	1,386	\$3,008,060	\$3,391,103	0.89	1,353	\$2,961,102	\$3,101,840	0.95	\$2,447	0.94
388	USAF CLINIC RANDOLPH	2,588	\$4,643,631	\$5,594,061	0.83	2,324	\$4,283,965	\$5,789,582	0.74	\$2,162	1.15
395	USAF CLINIC MCCHORD	899	\$2,342,585	\$4,263,174	0.55	1,198	\$2,747,210	\$2,729,120	1.01	\$4,742	0.48
449	24th MED GRP-HOWARD	1,247	\$2,818,691	\$2,421,950	1.16	1,059	\$2,560,565	\$2,887,214	0.89	\$1,942	1.39
799	USAF CLINIC GEILENKIRCHEN	683	\$2,048,313	\$571,593	3.58	774	\$2,172,289	\$763,739	2.84	\$837	1.18
800	USAF CLINIC RHEIN MAIN	1,630	\$3,338,479	\$3,263,182	1.02	1,500	\$3,161,371	\$3,709,820	0.85	\$2,002	1.24
801	USAF CLINIC SEMBACH	1,339	\$2,942,029	\$2,835,534	1.04	1,380	\$2,997,886	\$4,836,902	0.62	\$3,505	1.66
802	43rd STRAT CLINIC-ANDERSON	2,179	\$4,086,421	\$3,734,028	1.09	1,959	\$3,786,699	\$3,751,319	1.01	\$1,714	1.12
804	313th MED GRP-KADENA AB	3,311	\$5,828,828	\$5,255,748	1.07	3,678	\$4,125,892	\$7,441,639	0.82	\$2,024	1.28
805	USAF CLINIC SPANGDAHLEM	1,355	\$2,963,827	\$1,797,149	1.65	1,301	\$2,890,259	\$2,004,952	1.44	\$1,326	1.16
806	USAF CLINIC RAMSTEIN	3,287	\$5,595,929	\$4,988,472	1.12	3,159	\$5,421,546	\$6,493,428	0.83	\$1,518	1.35
807	USAF CLINIC ZWEIBRUCKEN	1,477	\$3,130,036	\$3,132,178	1.00	1,386	\$3,008,080	\$2,881,046	1.04	\$2,121	0.98
808	USAF CLINIC AVIANO	927	\$2,380,732	\$2,368,607	0.99	744	\$2,131,417	\$2,509,258	0.85	\$2,587	1.30

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**EXHIBIT 5-13: MODELED AND OBSERVED CLINIC AMBULATORY EXPENSES
(CONCLUDED)**

DMIS ID	FACILITY	FY88 AWUs	FY88 MODELED AMBULATORY EXPENSES	FY88 OBSERVED AMBULATORY EXPENSES	RATIO	FY89 AWUs	FY89 MODELED AMBULATORY EXPENSES	FY89 OBSERVED AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY89 OBSERVED EXPENSE/AWU	RATIO
812	USAF CLINIC BENTWATERS	1,701	\$3,435,208	\$3,861,853	0.94	1,547	\$3,225,402	\$3,527,924	0.91	\$2,153	\$2,280	1.06
813	USAF CLINIC CHICKSANDS	571	\$1,895,727	\$1,556,311	1.22	539	\$1,852,131	\$1,491,258	1.24	\$2,726	\$2,767	1.02
814	USAF CLINIC ALCONBURY-RAF UPWOOD	1,354	\$2,982,464	\$2,987,371	0.99	1,286	\$2,869,823	\$2,854,401	1.01	\$2,214	\$2,220	1.00
815	USAF CLINIC FAIRFORD	468	\$1,793,549	\$1,483,377	1.20	476	\$1,766,302	\$1,424,571	1.24	\$3,011	\$2,993	0.99
824	USAF CLINIC ANKARA	353	\$1,566,730	\$1,425,166	1.12	371	\$1,623,253	\$1,454,499	1.12	\$4,037	\$3,820	0.97
825	USAF CLINIC IZMIR	412	\$1,679,110	\$1,832,912	0.87	444	\$1,722,706	\$2,139,884	0.81	\$4,692	\$4,820	1.03
827	USAF CLINIC CAMP NEW AMSTERDAM	557	\$1,876,654	\$1,394,838	1.35	594	\$1,927,062	\$1,542,075	1.25	\$2,504	\$2,596	1.04
1160	USAF CLINIC COMISO	499	\$1,797,636	\$1,053,320	1.71	551	\$1,868,480	\$1,572,621	1.18	\$2,111	\$2,854	1.35
1161	USAF CLINIC FLORENNES	333	\$1,571,483	\$1,419,895	1.11					\$4,263		
1947	USAF CLINIC GREENHAM COMMON	684	\$2,049,675	\$1,952,020	1.05	642	\$1,992,456	\$1,761,362	1.13	\$2,854	\$2,744	0.96
	USAF CLINICS	54,783	\$119,347,334	\$119,100,609	1.00	51,959	\$114,382,183	\$127,606,314	0.90	\$2,174	\$2,456	1.13

There appear to be some data reporting problems at a few facilities as 7 clinics reported greater than a 50 percent change in observed costs per AWU. USAF Clinic Peterson reported a nearly 350 percent increase and NMCL Quantico (DMIS ID 385) reported roughly a 250 percent increase in expenses per AWU between FY88 and FY89.

Summary

This chapter provided a summary of the impact of applying the selected models to FY88 and FY89 workload and expense data. Exhibits 5-14 through 5-17 present summary total MEPRS inpatient and ambulatory expenses by Service branch and facility for medical centers, CONUS community hospitals, overseas hospitals, and clinics respectively. The total expenses were derived by summing the modeled and observed expenses from each of the three models - inpatient nonclinician, inpatient clinician, and ambulatory expense models. Note, PRIMUS/NAVCARE and Occupational Health expenses and workload have been excluded from these exhibits. The exhibits display the results of the models in aggregate as well as the change in observed unit costs (Expense per MWU) for each facility. This allows a summary review of the accuracy of the aggregated modeled expenses and a concise examination of the stability of unit costs at the facility level.

Exhibits 5-1 through 5-3 at the beginning of this chapter present a summary by facility type of the number of hospitals (excluding clinics) with greater than a 25 percent difference between modeled and observed expenses. Recall, 19 of 162 hospitals had more than a 25 percent difference between total modeled and observed expenses in FY88 and 20 of 161 hospitals in FY89. Additionally, 13 of 55 clinics had greater than a 25 percent difference between modeled and observed expenses in FY88 and 15 of 55 clinics had greater than a 25 percent difference in FY89.

EXHIBIT 5-14: MODELED AND OBSERVED MEDICAL CENTERS INPATIENT AND AMBULATORY EXPENSES

OMIS ID	FACILITY	FY88 MWUs	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	RATIO	FY88 MWUs	FY88 MODELED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	RATIO	FY88 OBSERVED EXPENSE/MWU	FY88 OBSERVED EXPENSE/MWU	RATIO
22	LETTERMAN AMC-PRESIDIO OF SF	32,077	\$76,354,171	0.98	28,857	\$69,003,373	\$83,045,476	0.83	\$2,435	\$2,878	1.18
31	FITZSIMONS AMC-DENVER	43,016	\$95,264,904	0.90	41,862	\$92,216,171	\$119,390,012	0.77	\$2,482	\$2,852	1.16
37	WALTER REED AMC-WASHINGTON	71,893	\$158,846,257	0.94	71,397	\$157,942,436	\$184,099,665	0.86	\$2,358	\$2,579	1.09
47	EISENHOWER AMC-FT GORDON	36,333	\$79,796,194	0.98	37,286	\$81,746,401	\$90,828,019	0.90	\$2,223	\$2,436	1.10
52	TRIPLER AMC-FT SHAFTER	50,891	\$110,516,256	0.90	51,287	\$111,040,148	\$130,802,977	0.85	\$2,426	\$2,546	1.05
108	WILLIAM BEAUMONT AMC-FT BLISS	44,800	\$96,557,641	1.08	43,814	\$94,734,339	\$94,114,726	1.01	\$2,009	\$2,148	1.07
125	MADIGAN AMC-FT LEWIS	50,872	\$111,866,723	1.16	49,312	\$108,918,143	\$100,805,776	1.08	\$1,885	\$2,040	1.08
	ARMY MEDICAL CENTERS	328,882.3	\$719,804,146	0.96	\$323,917	\$862,884,851	\$438,497,156	0.89	\$2,254	\$2,479	1.10
27	NH OAKLAND	22,344	\$59,868,375	0.97	21,300	\$57,456,674	\$70,395,410	0.82	\$2,771	\$3,305	1.19
29	NH SAN DIEGO	41,531	\$107,427,138	0.85	48,199	\$118,497,051	\$140,114,547	0.85	\$3,080	\$3,033	0.99
67	NH BETHESDA	36,396	\$91,468,943	0.84	37,498	\$94,006,360	\$113,536,638	0.83	\$2,977	\$3,028	1.02
124	NH PORTSMOUTH	42,354	\$103,444,602	0.96	43,635	\$106,455,828	\$109,724,507	0.97	\$2,552	\$2,515	0.99
	NAVY MEDICAL CENTERS	142,825	\$362,227,088	0.96	148,630	\$378,415,714	\$433,771,102	0.87	\$2,843	\$2,918	1.03
14	DAVID GRANT MED CTR-TRAVIS	28,543	\$63,139,838	1.13	24,987	\$59,865,920	\$65,232,196	0.91	\$2,114	\$2,613	1.24
56	USAF MED CTR SCOTT	17,841	\$42,263,424	1.00	15,720	\$38,055,564	\$39,937,910	0.95	\$2,370	\$2,541	1.07
66	MALCOM GROW MED CTR-ANDREWS	25,350	\$65,884,241	1.05	23,983	\$54,031,774	\$63,263,280	0.85	\$2,126	\$2,638	1.24
73	USAF MED CTR KEESLER	28,097	\$65,149,398	0.99	26,318	\$65,601,591	\$74,272,422	0.88	\$2,338	\$2,623	1.12
86	USAF MED CTR WRIGHT-PATTERSON	22,437	\$54,832,921	0.94	23,419	\$56,867,721	\$67,466,318	0.84	\$2,583	\$2,881	1.12
109	BROOKE AMC (JMMC)-FT SAM HOUSTON	57,612	\$130,196,770	1.01	56,032	\$126,349,687	\$123,181,164	1.03	\$2,241	\$2,198	0.98
117	WILFORD HALL MED CTR-LACKLAND	68,236	\$150,936,622	0.84	68,239	\$150,845,674	\$181,055,875	0.83	\$2,647	\$2,653	1.00
	USAF MEDICAL CENTERS	246,315	\$563,015,212	0.96	240,877	\$551,217,831	\$614,409,165	0.90	\$2,379	\$2,553	1.07

EXHIBIT 5-15: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS INPATIENT AND AMBULATORY EXPENSES

5-35

OWIS ID	FACILITY	FY88 MWUs	FY88 MODELED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	RATIO	FY88 MWUs	FY89 MODELED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY89 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	RATIO	FY88 OBSERVED EXPENSE/MWU	FY89 OBSERVE (1) EXPENSE/AWU	RATIO
1	FOX AH REDSTONE ARSENAL	5,257	\$10,763,517	\$10,691,965	1.01	5,839	\$11,759,323	\$13,819,800	0.86	\$2,034	\$2,333	1.15
2	NOBLE AH-FT MCCLELLAN	8,967	\$17,398,784	\$15,315,481	1.14	10,177	\$19,548,565	\$18,150,124	1.08	\$1,708	\$1,783	1.04
3	LYSTER AH-FT RUCKER	8,833	\$17,242,435	\$19,056,122	0.89	9,136	\$17,594,907	\$20,207,359	0.87	\$2,179	\$2,212	1.02
5	BASSETT ACH-FT WAINWRIGHT	7,298	\$14,298,607	\$19,389,944	0.74	7,627	\$14,889,643	\$19,783,046	0.75	\$2,657	\$2,594	0.98
8	BLISS AH-FT HUACHUCA	8,198	\$15,977,045	\$17,099,318	0.93	7,785	\$15,208,079	\$16,833,259	0.90	\$2,086	\$2,162	1.04
23	HAYS AH-FT ORD	20,861	\$38,370,772	\$43,002,093	0.89	22,352	\$40,962,164	\$48,097,609	0.85	\$2,061	\$2,152	1.04
32	EVANS AH-FT CARSON	18,458	\$34,080,825	\$35,894,022	0.95	20,983	\$38,489,765	\$41,573,077	0.93	\$1,945	\$1,981	1.02
48	MARTIN AH-FT BENNING	29,935	\$54,413,709	\$50,180,466	1.08	29,300	\$53,226,208	\$54,010,654	0.99	\$1,676	\$1,843	1.10
49	WINN AH-FT STEWART	14,057	\$26,273,560	\$30,805,361	0.85	14,991	\$27,813,314	\$35,940,039	0.77	\$2,192	\$2,398	1.09
57	IRWIN AH-FT RILEY	16,406	\$30,416,269	\$30,668,849	0.99	16,943	\$31,358,124	\$50,150,397	0.63	\$1,869	\$2,860	1.58
58	MUNSON AH-FT LEAVENWORTH	7,268	\$14,251,787	\$14,734,907	0.97	7,159	\$14,010,755	\$15,194,445	0.92	\$2,028	\$2,122	1.05
60	BLANCHFIELD ACH-FT CAMPBELL	24,915	\$45,530,374	\$41,158,984	1.11	23,413	\$42,719,549	\$42,389,542	1.01	\$1,652	\$1,811	1.10
61	IRELAND AH-FT KNOX	23,265	\$42,563,434	\$37,018,132	1.15	23,655	\$43,156,748	\$37,980,933	1.14	\$1,591	\$1,606	1.01
64	BAYNE-JONES AH-FT POLK	13,518	\$25,403,876	\$27,919,352	0.91	14,051	\$26,313,254	\$30,353,549	0.87	\$2,065	\$2,160	1.05
68	KIMBROUGH AH-FT MEADE	16,206	\$29,700,148	\$29,861,841	0.99	18,529	\$33,804,403	\$40,231,680	0.84	\$1,849	\$2,171	1.17
70	CUTLER AH-FT DEVENS	7,195	\$14,135,582	\$14,192,142	1.00	6,850	\$13,509,015	\$15,310,981	0.88	\$1,973	\$2,235	1.13
75	WOOD AH-FT LEONARD WOOD	19,373	\$35,814,531	\$38,672,760	0.93	21,194	\$38,852,980	\$42,344,710	0.92	\$1,996	\$1,998	1.00
81	PATTERSON AH-FT MONMOUTH	5,597	\$11,287,457	\$14,591,307	0.77	5,405	\$10,915,823	\$13,635,641	0.80	\$2,607	\$2,523	0.97
82	WALSON AH-FT DIX	16,205	\$30,080,680	\$33,282,877	0.90	15,051	\$32,987,910	\$32,663,446	0.96	\$2,054	\$2,170	1.06
86	KELLER AH WEST POINT	8,433	\$16,492,181	\$15,680,943	1.05	8,039	\$15,766,259	\$17,423,781	0.90	\$1,859	\$2,167	1.17
88	WOMACK AH-FT BRAGG	38,130	\$68,777,063	\$53,150,673	1.29	39,610	\$71,277,678	\$57,233,421	1.25	\$1,394	\$1,445	1.04
98	REYNOLDS AH-FT SILL	19,814	\$36,526,633	\$34,065,797	1.07	19,233	\$35,471,915	\$36,787,703	0.96	\$1,719	\$1,913	1.11
105	MONCHIEF AH-FT JACKSON	18,360	\$34,014,541	\$32,993,279	1.03	18,289	\$33,929,827	\$34,099,641	1.00	\$1,797	\$1,865	1.04
110	DARNAALL AH-FT HOOD	30,777	\$55,897,415	\$54,528,767	1.03	37,065	\$66,868,968	\$65,135,716	1.03	\$1,772	\$1,757	0.99
121	MCDONALD AH-FT EUSTIS	10,837	\$20,481,950	\$18,042,353	1.14	10,224	\$19,393,823	\$18,318,750	1.06	\$1,665	\$1,792	1.08
122	KENNER AH-FT LEE	9,850	\$18,885,031	\$17,321,396	1.09	10,447	\$20,017,530	\$19,453,871	1.03	\$1,758	\$1,862	1.06
123	DEWITT AH-FT BELVOIR	17,070	\$31,606,515	\$30,200,332	1.05	23,454	\$42,414,783	\$43,529,445	0.97	\$1,769	\$1,856	1.05
131	WEED ACH-FT IRWIN	3,399	\$7,483,659	\$9,650,672	0.76	3,984	\$8,528,071	\$13,059,702	0.65	\$2,899	\$3,278	1.13
294	HAWLEY AH-FT B. HARRISON	3,540	\$7,662,626	\$7,608,980	1.01	3,936	\$8,379,715	\$8,408,436	1.00	\$2,149	\$2,136	0.99
	ARMY CONUS COMMUNITY HOSPITAL	432,018	\$805,607,838	\$797,285,397	1.01	454,721	\$844,186,897	\$901,920,757	0.94	\$1,845	\$1,983	1.07
7	BRH NAVSTA ADAK	1,193	\$4,850,860	\$4,169,863	1.16	1,516	\$5,606,952	\$2,547,359	2.20	\$3,495	\$1,680	0.48
24	NH CAMP PENDLETON	17,096	\$42,662,396	\$43,044,608	0.99	18,487	\$45,948,199	\$45,216,642	1.02	\$2,518	\$2,446	0.97
25	NH LONG BEACH	11,032	\$28,200,691	\$40,771,969	0.69	12,664	\$31,998,568	\$43,731,606	0.73	\$3,696	\$3,453	0.93
28	NH LEWIS	4,148	\$11,823,903	\$9,587,847	1.23	3,714	\$10,775,590	\$9,800,627	1.10	\$2,312	\$2,639	1.14
30	BRH MAGAGCC TWENTY NINE PALMS	3,734	\$10,867,988	\$6,664,013	1.63	4,113	\$11,754,130	\$9,223,214	1.27	\$1,785	\$2,243	1.26
35	NH GROTON	6,501	\$17,385,751	\$22,644,640	0.77	6,439	\$17,219,856	\$24,665,367	0.70	\$3,483	\$3,830	1.10
38	NH PENSACOLA	15,193	\$37,969,968	\$40,558,492	0.94	17,434	\$43,316,258	\$43,862,738	0.99	\$2,670	\$2,516	0.94
39	NH JACKSONVILLE	21,051	\$51,923,008	\$53,171,770	0.98	22,029	\$54,200,923	\$61,362,848	0.88	\$2,526	\$2,786	1.10
40	NH ORLANDO	13,750	\$34,552,072	\$33,033,897	1.05	15,548	\$38,754,486	\$36,291,020	1.07	\$2,402	\$2,334	0.97
56	NH GREAT LAKES	21,095	\$51,854,609	\$47,795,393	1.08	21,317	\$52,291,439	\$46,287,445	1.13	\$2,266	\$2,171	0.96
68	NH PATUXENT RIVER	2,567	\$8,079,862	\$5,788,683	1.40	2,980	\$9,055,761	\$9,152,396	0.99	\$2,255	\$3,071	1.36
91	NH CAMP LEJUNE	14,791	\$37,183,065	\$33,529,918	1.11	17,386	\$43,280,289	\$39,010,250	1.11	\$2,267	\$2,244	0.99
95	NH CHERRY POINT	5,860	\$15,874,388	\$11,474,742	1.38	6,334	\$16,962,421	\$13,930,932	1.22	\$1,958	\$2,199	1.12

Continued

EXHIBIT 5-15. MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS INPATIENT AND AMBULATORY EXPENSES
(CONTINUED)

90	NH PHILADELPHIA	6,520	\$17,442,103	\$21,259,790	0.82	6,303	\$21,594,404	\$23,973,757	0.90	\$3,261	\$2,487	0.89
100	NH NEWPORT	5,337	\$14,690,535	\$19,946,130	0.74	5,422	\$14,887,228	\$20,207,881	0.74	\$3,737	\$3,727	1.00
103	NH CHARLESTON	17,060	\$42,635,023	\$36,965,737	1.15	18,223	\$45,362,000	\$44,850,049	1.01	\$2,167	\$2,461	1.14
104	NH BEAUFORT	8,953	\$23,142,123	\$20,010,942	1.16	8,977	\$23,184,975	\$23,426,487	0.99	\$2,235	\$2,610	1.17
107	NH MILLINGTON	7,778	\$20,433,549	\$22,851,852	0.89	7,638	\$20,104,356	\$25,638,190	0.78	\$2,938	\$3,357	1.14
118	NH CORPUS CHRISTI	5,149	\$14,201,432	\$17,059,012	0.83	5,153	\$14,198,058	\$20,235,134	0.70	\$3,313	\$3,927	1.19
126	NH BREMERTON	10,193	\$26,235,131	\$25,371,382	1.03	13,407	\$33,686,931	\$25,262,303	1.33	\$2,489	\$1,884	0.76
127	NH OAK HARBOR	3,658	\$10,680,524	\$7,791,747	1.37	4,047	\$11,578,878	\$7,689,410	1.51	\$2,130	\$1,900	0.89
	NAVY CONUS HOSPITALS	202,659	\$522,888,980	\$523,492,427	1.00	221,130	\$565,761,702	\$576,365,655	0.98	\$2,583	\$2,606	1.01
4	AIR UNIVERSITY RGN HOSP-MAXWELL	8,931	\$18,490,676	\$18,968,236	0.97	8,984	\$18,416,386	\$12,951,312	1.42	\$2,124	\$1,456	0.69
6	USAF HOSP ELMENDORF	11,605	\$23,534,782	\$27,540,808	0.85	10,463	\$21,372,822	\$28,657,588	0.75	\$2,373	\$2,739	1.15
9	832nd MED GRP-LUKE	9,358	\$19,286,691	\$18,277,595	1.08	9,171	\$18,940,896	\$20,822,524	0.92	\$1,953	\$2,249	1.15
10	832nd MED GRP-DAVIS MONTHAN	8,575	\$17,821,783	\$20,350,852	0.88	9,318	\$19,221,938	\$22,207,704	0.87	\$2,373	\$2,383	1.00
11	USAF HOSP WILLIAMS	3,909	\$9,006,395	\$12,086,003	0.75	3,950	\$8,898,409	\$11,371,531	0.78	\$3,092	\$2,953	0.96
12	97th STRAT HOSP-EAKER	3,339	\$7,930,597	\$7,836,522	1.01	3,149	\$7,571,235	\$8,246,997	0.92	\$2,347	\$2,820	1.12
13	USAF HOSP LITTLE ROCK	5,022	\$11,113,411	\$11,099,411	1.00	6,096	\$13,134,626	\$12,848,973	1.02	\$2,210	\$2,108	0.95
15	9th STRAT HOSP-BEALE	4,004	\$9,168,149	\$10,209,285	0.90	3,883	\$9,144,484	\$10,067,546	0.91	\$2,550	\$2,528	0.99
16	USAF HOSP MATHER	8,578	\$17,818,954	\$19,528,035	0.91	7,943	\$16,619,751	\$19,834,473	0.84	\$2,276	\$2,497	1.10
17	804th STRAT HOSP-CASTLE	5,596	\$12,198,520	\$10,299,955	1.18	5,170	\$11,388,162	\$10,556,973	1.08	\$1,841	\$2,042	1.11
18	1st STRAT HOSP-VANDENBERG	5,110	\$11,275,128	\$11,115,650	1.01	4,973	\$10,826,883	\$11,480,333	0.94	\$2,175	\$2,358	1.08
19	USAF HOSP EDWARDS	3,823	\$8,847,048	\$9,104,130	0.97	3,969	\$9,120,999	\$7,034,778	1.30	\$2,381	\$1,772	0.74
20	831st MED GRP-GEORGE	5,171	\$11,390,593	\$10,149,129	1.12	5,158	\$11,384,181	\$10,542,328	1.08	\$1,963	\$2,044	1.04
21	22nd STRAT HOSP-MARCH	10,410	\$21,282,222	\$23,488,514	0.91	10,406	\$21,269,698	\$27,191,652	0.78	\$2,256	\$2,613	1.16
33	USAF ACADEMY HOSP	11,715	\$23,749,660	\$25,336,528	0.94	11,286	\$22,930,467	\$27,880,278	0.83	\$2,163	\$2,453	1.13
36	USAF HOSP DOVER	4,932	\$10,942,452	\$9,536,751	1.14	4,459	\$10,044,948	\$11,776,844	0.85	\$1,938	\$2,641	1.36
42	USAF RGN HOSP EGLIN	18,829	\$36,793,480	\$37,159,769	0.99	17,186	\$34,061,795	\$39,563,778	0.86	\$1,995	\$2,302	1.15
43	325th MED GRP-TYNDALL	5,105	\$11,287,692	\$14,878,230	0.77	5,869	\$12,705,667	\$18,438,979	0.77	\$2,875	\$2,801	0.97
44	31st MED GRP-HOMESTEAD	6,899	\$18,054,783	\$18,037,382	1.00	6,482	\$17,639,538	\$19,085,935	0.92	\$2,073	\$2,250	1.09
45	56th MED GRP-MACDILL	11,077	\$22,548,375	\$22,031,696	1.02	10,951	\$22,299,758	\$24,606,198	0.91	\$1,989	\$2,247	1.13
48	USAF HOSP PATRICK	4,299	\$9,750,613	\$11,586,321	0.84	3,963	\$9,111,077	\$10,537,099	0.86	\$2,690	\$2,659	0.99
50	347th MED GRP-MOODY	4,011	\$9,201,443	\$9,576,683	0.96	3,854	\$8,901,721	\$10,882,936	0.82	\$2,388	\$2,824	1.18
51	USAF HOSP ROBINS	4,886	\$10,854,191	\$11,690,268	0.93	4,742	\$10,580,890	\$11,604,297	0.91	\$2,393	\$2,447	1.02
53	368th MED GRP-MOUNTAIN HOME	4,075	\$9,320,749	\$9,427,899	1.11	3,708	\$8,822,598	\$9,028,577	0.96	\$2,068	\$2,436	1.18
54	USAF HOSP CHANUTE	5,180	\$11,409,474	\$10,152,738	1.12	4,487	\$10,098,999	\$10,067,724	1.00	\$1,960	\$2,244	1.14
59	384th STRAT HOSP-MCCONNELL	2,158	\$5,701,489	\$6,707,247	0.85	2,393	\$6,145,589	\$7,206,204	0.85	\$3,109	\$3,011	0.97
62	2nd STRAT HOSP-BARKSDALE	8,851	\$18,340,281	\$16,120,350	1.14	8,094	\$16,908,467	\$16,038,846	1.05	\$1,821	\$1,982	1.09
63	23rd MED GRP-ENGLAND	3,646	\$8,511,551	\$9,150,979	0.93	3,599	\$8,421,059	\$10,069,528	0.84	\$2,510	\$2,798	1.11
65	42nd STRAT HOSP-LORING	3,195	\$7,657,171	\$6,443,862	1.19	2,814	\$6,935,959	\$7,104,516	0.98	\$2,017	\$2,525	1.25
71	379th STRAT HOSP-WURTSMITH	3,337	\$7,927,227	\$8,070,894	0.98	2,950	\$7,194,169	\$7,836,634	0.91	\$2,419	\$2,691	1.11
72	410th STRAT HOSP-KILSAWYER	3,284	\$7,789,491	\$7,960,129	0.98	3,282	\$7,822,281	\$8,477,993	0.92	\$2,439	\$2,583	1.06
74	USAF HOSP COLUMBUS	2,111	\$5,614,065	\$6,337,852	0.89	1,947	\$5,301,244	\$6,256,572	0.85	\$3,002	\$3,214	1.07
76	351st STRAT HOSP-WHEATMAN	3,700	\$8,612,123	\$7,810,983	1.10	3,872	\$8,933,446	\$8,274,516	1.08	\$2,111	\$2,137	1.01
78	EHRLING BERQUIST RGN HOSP-OFFUTT	13,127	\$26,415,833	\$23,031,376	1.15	13,976	\$28,012,798	\$30,763,535	0.91	\$1,754	\$2,201	1.25
79	504th MED GRP-NELLIS	7,441	\$15,683,629	\$14,778,991	1.06	6,330	\$17,353,547	\$16,490,773	1.05	\$1,986	\$1,980	1.00

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EXHIBIT 5-15: MODELED AND OBSERVED CONUS COMMUNITY HOSPITALS INPATIENT AND AMBULATORY EXPENSES
(CONCLUDED)

80	509th STRAT HOSP PEASE	5.748	\$12,479,891	\$13,780,454	0.91	5.988	\$12,929,181	\$16,490,773	0.94	\$2,397	\$2,308	0.96
83	USAF HOSP KIRTLAND	7.152	\$15,132,972	\$14,836,852	1.02	6.987	\$14,817,448	\$13,823,091	1.10	\$2,075	\$1,926	0.93
84	833rd MED GRP HOLLOWAY	4.787	\$10,629,661	\$9,872,498	1.08	4.621	\$10,351,792	\$9,931,334	1.04	\$2,071	\$2,149	1.04
85	27th MED GRP CANNON	3.830	\$8,859,049	\$9,011,015	0.98	3.491	\$8,215,618	\$8,647,945	0.95	\$2,352	\$2,477	1.05
87	380th STRAT HOSP PLATTSBURGH	3.111	\$7,501,785	\$7,180,463	1.04	2.757	\$6,831,161	\$7,252,263	0.94	\$2,308	\$2,631	1.14
88	418th STRAT HOSP GRIFFISS	4.099	\$9,368,745	\$9,165,683	1.02	3.914	\$9,016,085	\$10,305,009	0.87	\$2,236	\$2,633	1.18
90	4th MED GRP SEYMOUR JOHNSON	4.351	\$9,843,380	\$8,599,523	1.14	4.626	\$10,360,133	\$10,634,229	0.97	\$1,976	\$2,299	1.16
93	842nd STRAT HOSP GRAND FORKS	5.102	\$11,261,778	\$8,573,062	1.31	4.421	\$9,972,811	\$8,926,223	1.12	\$1,680	\$2,019	1.20
94	837th STRAT HOSP MINOT	6.130	\$13,199,515	\$11,432,285	1.15	5.774	\$12,524,418	\$11,819,225	1.06	\$1,865	\$2,047	1.10
96	USAF HOSP TINKER	8.355	\$17,406,315	\$13,930,808	1.25	8.533	\$17,739,525	\$9,211,447	1.93	\$1,667	\$1,080	0.65
97	USAF HOSP ALTUS	3.284	\$7,827,188	\$7,408,557	1.06	2.944	\$7,182,909	\$8,478,778	0.85	\$2,255	\$2,880	1.28
101	363rd MED GRP SHAW	6.002	\$12,960,928	\$18,558,022	0.70	5.712	\$12,410,405	\$12,217,891	1.02	\$3,092	\$2,139	0.69
102	354th MED GRP MYRTLE BEACH	3.493	\$8,225,617	\$8,176,901	1.01	3.136	\$7,547,839	\$8,360,396	0.90	\$2,341	\$2,666	1.14
106	44th STRAT HOSP ELLSWORTH	6.701	\$14,280,380	\$11,269,832	1.27	5.997	\$12,946,201	\$11,549,538	1.12	\$1,682	\$1,928	1.15
111	USAF HOSP REESE	2.378	\$6,117,994	\$5,974,005	1.02	2.010	\$5,421,554	\$5,838,063	0.93	\$2,512	\$2,904	1.16
112	98th STRAT HOSP DYESS	6.652	\$14,187,217	\$11,515,279	1.23	5.919	\$12,797,739	\$11,924,031	1.07	\$1,731	\$2,015	1.16
113	USAF RGN HOSP SHEPPARD	11.118	\$22,617,738	\$24,781,842	0.91	10.410	\$21,271,927	\$25,190,567	0.84	\$2,229	\$2,420	1.09
114	USAF HOSP LAUGHLIN	2.578	\$6,493,888	\$5,882,498	1.14	2.243	\$5,881,032	\$7,008,128	0.84	\$2,204	\$3,124	1.42
115	67th MED GRP BERGSTROM	5.039	\$11,145,184	\$12,154,681	0.92	4.528	\$10,177,614	\$12,523,297	0.81	\$2,412	\$2,766	1.15
116	R. THOMPSON STRAT HOSP CARSWELL	15.187	\$30,257,241	\$34,331,493	0.88	15.004	\$29,941,808	\$36,784,981	0.81	\$2,264	\$2,452	1.08
119	USAF HOSP HILL	6.123	\$13,188,292	\$10,706,894	1.23	6.347	\$13,810,000	\$12,681,953	1.07	\$1,749	\$1,998	1.14
120	1st MED GRP LANGLEY	11.778	\$23,891,822	\$22,967,285	1.04	11.095	\$22,572,002	\$23,282,105	0.97	\$1,950	\$2,097	1.08
128	92nd STRAT HOSP FAIRCHILD	6.872	\$14,801,590	\$13,428,598	1.09	7.052	\$14,936,898	\$14,516,108	1.03	\$1,954	\$2,058	1.05
129	90th STRAT HOSP F.E. WARREN	4.479	\$10,082,888	\$9,495,985	1.06	3.980	\$9,100,590	\$7,631,935	1.19	\$2,120	\$1,927	0.91
	USAF CONUS HOSPITALS	371.176	\$798,874,888	\$787,513,307	1.00	360.158	\$775,848,954	\$825,487,521	0.94	\$2,149	\$2,292	1.07

EXHIBIT 5-16: MODELED AND OBSERVED OVERSEAS HOSPITALS INPATIENT AND AMBULATORY EXPENSES

DMIS ID	FACILITY	FY88 MMUs	FY88 MODELED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	RATIO	FY88 MMUs	FY88 MODELED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	RATIO	FY88 OBSERVED EXPENSE/MMU	FY88 OBSERVED EXPENSE/MMU	RATIO
601	34th GENERAL HOSP ALGSBURG	8,686	\$19,814,561	\$21,304,767	0.93	737	\$19,888,593	\$23,556,242	0.84	\$2,453	\$2,696	1.10
602	5th GENERAL HOSP-BAD CANNSTATT	14,591	\$31,748,319	\$30,826,306	1.03	14,104	\$31,146,257	\$33,978,709	0.92	\$2,113	\$2,375	1.12
604	2nd FIELD HOSP BREMERHAVEN	4,781	\$11,970,450	\$11,760,864	1.02	4,752	\$11,902,746	\$13,131,873	0.91	\$2,460	\$2,762	1.12
605	97th GENERAL HOSP-FRANKFURT	29,643	\$61,783,063	\$62,575,781	0.99	26,251	\$55,054,365	\$78,322,405	0.70	\$2,111	\$2,982	1.41
606	130th STATN HOSP-HEIDELBERG	13,310	\$29,009,612	\$28,983,869	1.08	12,406	\$27,144,640	\$30,261,734	0.90	\$2,027	\$2,439	1.20
607	2nd GENERAL HOSP LANDSTUHL	25,580	\$54,168,870	\$57,442,873	0.94	24,682	\$52,300,061	\$56,077,183	0.93	\$2,246	\$2,272	1.01
608	98th GENERAL HOSP-NURNBERG	18,909	\$40,277,950	\$43,834,789	0.92	19,105	\$40,647,344	\$41,271,875	0.98	\$2,318	\$2,160	0.93
609	67th EVACUATION HOSP-WURZBURG	11,785	\$25,945,557	\$14,969,267	1.73	11,783	\$5,917,006	\$24,713,206	1.05	\$1,270	\$2,097	1.65
611	45th FIELD HOSP-VICENZA	3,132	\$8,650,376	\$13,235,054	0.65	2,868	\$1,103,684	\$9,969,280	0.81	\$4,226	\$3,476	0.82
612	121st EVACUATION HOSP-SEOUL	18,067	\$38,687,719	\$40,174,587	0.96	16,499	\$35,169,733	\$43,559,729	0.81	\$2,224	\$2,640	1.19
613	EVORGAS ACH	14,547	\$31,627,348	\$28,691,350	1.07	13,848	\$30,435,544	\$31,554,348	0.96	\$2,041	\$2,279	1.12
	ARMY OVERSEAS HOSPITALS	163,031	\$353,883,824	\$352,799,516	1.00	155,254	\$338,039,973	\$386,396,584	0.87	\$2,164	\$2,489	1.15
615	NH GUANTANAMO BAY	2,358	\$8,116,174	\$7,027,960	1.15	2,431	\$8,265,461	\$8,457,956	0.98	\$2,980	\$3,480	1.17
616	NH ROOSEVELT ROADS-CEBA	3,796	\$11,422,658	\$13,753,271	0.83	4,042	\$11,981,479	\$13,193,651	0.91	\$3,623	\$3,264	0.90
617	NH NAPLES	4,596	\$13,215,736	\$15,916,166	0.83	5,048	\$14,237,809	\$16,310,659	0.87	\$3,463	\$3,231	0.93
618	NH ROTA	3,243	\$10,133,542	\$8,501,216	1.19	3,464	\$10,622,442	\$10,594,326	1.00	\$2,621	\$3,058	1.17
619	NH SUBIC BAY	8,232	\$21,592,344	\$14,450,117	1.49	9,997	\$25,494,054	\$16,875,312	1.51	\$1,755	\$1,688	0.96
620	NH GUAM AGANA	7,132	\$19,111,095	\$18,532,936	1.03	7,237	\$19,364,139	\$22,710,627	0.85	\$2,599	\$3,138	1.21
621	NH OKINAWA	11,280	\$28,818,067	\$32,981,574	0.87	10,253	\$26,388,822	\$30,823,137	0.86	\$2,924	\$3,006	1.03
622	NH YOKOSUKA	8,484	\$22,155,852	\$23,684,359	0.94	9,235	\$23,792,764	\$23,737,579	1.00	\$2,792	\$2,570	0.92
	NAVY OVERSEAS HOSPITALS	49,123	\$134,565,469	\$134,847,599	1.00	51,706	\$140,146,970	\$142,703,247	0.98	\$2,745	\$2,760	1.01
626	USAF HOSP BITBURG	4,437	\$9,492,289	\$7,226,634	1.31	3,782	\$8,278,233	\$7,147,701	1.16	\$1,629	\$1,890	1.16
627	USAF HOSP HAHN	3,909	\$8,548,739	\$7,277,250	1.17	3,743	\$8,219,156	\$7,451,610	1.10	\$1,862	\$1,991	1.07
628	USAF RGN MED CTR WIESBADEN	14,051	\$26,553,510	\$29,440,531	0.90	13,616	\$25,784,729	\$25,492,504	1.01	\$2,095	\$1,872	0.89
629	USAF HOSP LAJES	1,367	\$4,270,720	\$4,142,150	1.03	1,426	\$4,359,990	\$4,886,464	0.89	\$3,031	\$3,428	1.13
630	USAF HOSP TORREJON	4,306	\$9,337,570	\$9,244,761	1.01	3,470	\$7,864,337	\$10,269,740	0.77	\$2,147	\$2,959	1.38
631	USAF HOSP HELLENKON	1,702	\$4,773,879	\$3,429,656	1.39	1,239	\$4,015,166	\$3,307,748	1.21	\$2,015	\$2,670	1.32
632	USAF HOSP UPPER HEYFORD	4,841	\$10,204,580	\$11,262,090	0.91	4,523	\$9,638,402	\$9,792,065	0.98	\$2,326	\$2,165	0.93
633	USAF RGN HOSP LAKENHEATH	8,291	\$16,130,354	\$12,660,153	1.27	7,784	\$15,316,088	\$16,372,305	0.94	\$1,527	\$2,103	1.38
634	USAF HOSP IRAKLION	590	\$2,937,386	\$2,273,409	1.29	659	\$3,067,272	\$2,017,101	1.52	\$3,854	\$3,063	0.79
635	USAF HOSP INCIRLIK	2,518	\$6,285,354	\$7,534,818	0.83	2,569	\$6,370,446	\$5,530,404	1.15	\$2,992	\$2,152	0.72
636	13th MED CENTER-CLARK AB	16,484	\$30,591,110	\$31,425,536	0.97	16,578	\$30,776,564	\$32,070,570	0.96	\$1,906	\$1,934	1.01
637	8th MED GRP KUNSON AB	1,024	\$3,680,220	\$4,362,677	0.84	941	\$3,531,070	\$2,605,794	1.36	\$4,260	\$2,768	0.65
638	51st MED GRP-OSAN AB	3,510	\$7,919,730	\$7,914,643	1.00	2,908	\$6,829,594	\$7,710,811	0.89	\$2,255	\$2,652	1.18
639	432nd MED GRP-MISAWA	3,578	\$7,954,569	\$8,761,026	0.91	3,615	\$8,036,714	\$5,904,181	1.36	\$2,448	\$1,633	0.67
640	475th MED GRP-YOKOTA AB	4,184	\$9,052,478	\$11,545,331	0.78	4,027	\$8,766,513	\$12,313,247	0.71	\$2,759	\$3,058	1.11
	USAF OVERSEAS HOSPITALS	74,792	\$157,732,505	\$159,500,666	1.00	70,881	\$150,854,272	\$152,872,245	0.99	\$2,119	\$2,157	1.02

EXHIBIT 5-17: MODELED AND OBSERVED CLINIC INPATIENT AND AMBULATORY EXPENSES

DMIS ID	FACILITY	FY88 AWUs	FY88 MODELED INPATIENT & AMBULATORY EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY EXPENSES	RATIO	FY88 AWUs	FY88 MODELED INPATIENT & AMBULATORY EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY88 OBSERVED EXPENSE/AWU	RATIO
330	WILCOX AHC-FT DRUM	3,542	\$8,016,669	\$7,538,177	1.06	4,273	\$8,359,981	\$10,518,189	0.89	\$2,128	\$2,462	1.16
610	USAF SAGAMI-JAPAN	905	\$3,170,823	\$3,479,701	0.91	934	\$3,224,114	\$3,327,006	0.97	\$3,845	\$3,562	0.93
	ARMY CLINICS	4,447	\$11,187,492	\$11,017,878	1.02	5,207	\$12,584,065	\$13,845,195	0.91	\$2,478	\$2,659	1.07
26	MMCL PORT HUENEME	1,698	\$4,940,261	\$3,956,813	1.25	2,018	\$6,578,116	\$1,747,132	3.19	\$2,330	\$866	0.37
41	MMCL KEY WEST	905	\$3,390,881	\$3,955,079	0.86	917	\$3,414,463	\$4,006,939	0.85	\$4,370	\$4,370	1.00
280	MMCL PEARL HARBOR	6,366	\$14,122,875	\$10,936,579	1.29	6,163	\$13,723,746	\$12,384,625	1.11	\$1,718	\$2,006	1.17
297	MMCL NEW ORLEANS	1,163	\$3,897,895	\$4,957,219	0.79	1,136	\$3,844,836	\$5,166,116	0.74	\$4,262	\$4,548	1.07
306	MMCL ANNA POLIS	1,821	\$5,190,977	\$5,663,227	0.92	1,868	\$5,318,713	\$6,042,117	0.88	\$3,110	\$3,204	1.03
321	MMCL PORT SMOUTH	1,107	\$3,787,846	\$4,701,715	0.81	1,162	\$3,895,930	\$5,025,613	0.78	\$4,247	\$4,325	1.02
386	MMCL QUANTICO	6,293	\$13,979,217	\$11,110,896	1.26	2,608	\$6,733,636	\$11,340,548	0.59	\$1,766	\$4,352	2.46
398	MMCL SEATTLE	620	\$2,830,808	\$3,309,332	0.86	711	\$3,009,638	\$1,309,017	2.30	\$5,338	\$1,841	0.34
528	MMCL SAN FRANCISCO	4,274	\$10,011,539	\$10,974,501	0.91	4,673	\$10,795,642	\$11,302,418	0.96	\$2,568	\$2,419	0.94
701	MMCL SAN DIEGO	12,470	\$26,118,072	\$19,770,211	1.32	12,170	\$25,528,521	\$19,474,527	1.31	\$1,585	\$1,600	1.01
702	MMCL NORFOLK	9,186	\$19,662,489	\$23,258,294	0.97	10,011	\$21,285,719	\$23,858,340	0.89	\$2,206	\$2,383	1.08
703	MMCL WASHINGTON DC	1,707	\$4,966,948	\$5,470,050	0.91	1,594	\$4,744,883	\$821,377	5.15	\$3,204	\$578	0.18
8931	MMCL LONDON	776	\$3,137,374	\$2,894,238	1.08	777	\$3,139,340	\$2,022,808	1.55	\$3,730	\$2,603	0.70
	NAVY CLINICS	48,385	\$116,045,983	\$107,957,154	1.07	45,824	\$111,013,182	\$104,581,577	1.06	\$2,231	\$2,282	1.02
203	USAF CLINIC EIELSON	1,690	\$3,420,221	\$3,659,432	0.93	1,586	\$3,294,883	\$3,803,767	0.87	\$2,165	\$2,380	1.10
248	USAF CLINIC LOS ANGELES	858	\$2,284,003	\$1,947,436	1.17	880	\$2,316,700	\$2,763,577	0.84	\$2,275	\$3,140	1.38
249	USAF CLINIC NORTON	2,548	\$4,596,137	\$6,522,561	0.70	2,221	\$4,143,641	\$2,317,805	0.66	\$2,580	\$2,845	1.11
250	USAF CLINIC MCCLELLAN	2,218	\$4,136,554	\$5,233,767	0.79	2,266	\$4,232,195	\$5,023,594	0.84	\$2,360	\$2,198	0.93
251	USAF CLINIC LOWRY	1,367	\$2,980,175	\$2,748,439	1.08	978	\$2,460,213	\$2,185,023	1.12	\$2,011	\$2,234	1.11
252	USAF CLINIC PETERSON	2,667	\$4,751,259	\$1,764,517	2.69	2,584	\$4,638,182	\$5,938,953	0.78	\$662	\$2,298	3.47
287	15th MED GRP HICKAM	2,644	\$4,747,172	\$5,982,580	0.79	2,433	\$4,432,464	\$6,386,571	0.69	\$2,246	\$2,625	1.17
293	305th STRAT HOSP-GRISSOM	1,582	\$3,245,838	\$4,307,680	0.75	1,480	\$3,108,876	\$4,387,258	0.71	\$2,758	\$3,005	1.09
310	USAF CLINIC HANSCOM	1,159	\$2,692,802	\$3,745,300	0.72	1,148	\$2,681,816	\$3,146,529	0.85	\$3,231	\$2,741	0.85
326	USAF CLINIC MCGUIRE	1,266	\$2,842,576	\$2,898,105	0.98	1,202	\$2,755,384	\$2,745,708	1.00	\$2,289	\$2,284	1.00
335	USAF CLINIC POPE	1,486	\$3,146,022	\$2,495,844	0.90	1,254	\$2,626,227	\$3,637,431	0.78	\$2,349	\$2,901	1.23
338	USAF CLINIC VANCE	743	\$2,130,055	\$2,340,065	0.91	869	\$2,301,714	\$1,885,234	1.22	\$3,149	\$2,169	0.69
358	USAF CLINIC CHARLESTON	2,088	\$3,982,445	\$3,986,482	0.99	1,813	\$3,587,793	\$4,429,142	0.81	\$1,909	\$2,443	1.28
363	USAF CLINIC BROOKS	726	\$2,106,895	\$1,951,541	1.08	696	\$2,066,024	\$2,173,595	0.95	\$2,688	\$3,123	1.16
364	USAF CLINIC GOODFELLOW	1,376	\$2,992,437	\$3,175,369	0.94	1,291	\$2,876,635	\$3,056,437	0.94	\$2,308	\$2,367	1.03
365	USAF CLINIC KELLY	1,388	\$3,006,060	\$3,391,103	0.89	1,353	\$2,961,102	\$3,101,640	0.95	\$2,447	\$2,292	0.94
366	USAF CLINIC RANDOLPH	2,589	\$4,643,631	\$5,594,061	0.83	2,324	\$4,283,965	\$5,789,582	0.74	\$2,162	\$2,491	1.15
395	USAF CLINIC MCCORD	896	\$2,342,585	\$4,263,174	0.56	1,196	\$2,747,210	\$2,729,120	1.01	\$4,742	\$2,282	0.48
449	24th MED GRP HOWARD	1,247	\$2,816,691	\$2,421,691	1.16	1,059	\$2,560,565	\$2,867,214	0.89	\$1,942	\$2,707	1.39
799	USAF CLINIC GEILENKIRCHEN	683	\$2,048,313	\$571,593	3.58	774	\$2,172,289	\$763,739	2.84	\$837	\$987	1.18
800	USAF CLINIC RHEIN MAIN	1,630	\$3,338,479	\$3,263,182	1.02	1,500	\$3,161,371	\$3,709,820	0.85	\$2,002	\$2,473	1.24
801	USAF CLINIC SEMBACH	1,339	\$2,942,029	\$2,835,534	1.04	1,380	\$2,997,886	\$4,636,902	0.62	\$2,118	\$3,505	1.66
802	43rd STRAT CLINIC-ANDERSON	1,179	\$4,086,421	\$3,734,026	1.09	1,959	\$3,786,699	\$3,751,319	1.01	\$1,714	\$1,915	1.12
804	313th MED GRP-KADENA AB	3,311	\$5,628,626	\$5,255,746	1.07	3,676	\$6,125,892	\$7,441,639	0.82	\$1,587	\$2,024	1.28
805	USAF CLINIC SPANGDAHEM	1,355	\$2,963,827	\$1,797,149	1.65	1,301	\$2,890,259	\$2,004,952	1.44	\$1,326	\$1,541	1.16
806	USAF CLINIC RAMSTEIN	3,287	\$5,596,929	\$4,988,472	1.12	3,159	\$5,421,546	\$6,493,428	0.83	\$1,518	\$2,056	1.35
807	USAF CLINIC ZWEIBRUCKEN	1,477	\$3,130,036	\$3,132,178	1.00	1,386	\$3,006,060	\$2,881,046	1.04	\$2,121	\$2,079	0.98
808	USAF CLINIC AVIANO	927	\$2,390,732	\$2,398,607	0.99	744	\$2,131,417	\$2,509,258	0.85	\$2,587	\$3,373	1.30

CONTINUED

EXHIBIT 5-17: MODELED AND OBSERVED CLINIC INPATIENT AND AMBULATORY EXPENSES
(CONCLUDED)

DMIS ID	FACILITY	FY88 AWUs	FY88 MODELED INPATIENT AMBULATORY EXPENSES	FY88 OBSERVED INPATIENT AMBULATORY EXPENSES	RATIO	FY89 AWUs	FY89 MODELED INPATIENT AMBULATORY EXPENSES	FY89 OBSERVED INPATIENT AMBULATORY EXPENSES	RATIO	FY88 OBSERVED EXPENSE/AWU	FY89 OBSERVED EXPENSE/AWU	RATIO
808	USAF CLINIC SAN VITO	578	\$1,905,264	\$1,602,180	1.19	534	\$1,845,319	\$1,908,830	0.97			
811	USAF CLINIC ZRAGOZA	519	\$1,824,884	\$1,205,901	1.51	451	\$1,732,243	\$1,170,606	1.48	\$2,772	\$3,575	1.29
812	USAF CLINIC BENTWATERS	1,701	\$3,436,208	\$3,661,853	0.94	1,547	\$3,225,402	\$3,527,924	0.91	\$2,324	\$2,596	1.12
813	USAF CLINIC CHICKSANDS	571	\$1,895,727	\$1,558,311	1.22	539	\$1,852,131	\$1,491,258	1.24	\$2,153	\$2,280	1.06
814	USAF CLINIC ALCONBURY-RAF UPWOOD	1,354	\$2,982,464	\$2,997,371	0.99	1,286	\$2,869,823	\$2,854,401	1.01	\$2,726	\$2,767	1.02
815	USAF CLINIC FAIRFORD	486	\$1,783,549	\$1,493,377	1.20	476	\$1,766,302	\$1,424,571	1.24	\$2,214	\$2,220	1.00
824	USAF CLINIC ANKARA	353	\$1,598,730	\$1,425,168	1.12	371	\$1,823,253	\$1,454,499	1.12	\$4,037	\$3,920	0.97
825	USAF CLINIC IZMIR	412	\$1,879,110	\$1,932,912	0.87	444	\$1,722,706	\$2,139,884	0.81	\$4,692	\$4,820	1.03
827	USAF CLINIC CAMP NEW AMSTERDAM	557	\$1,878,654	\$1,394,638	1.36	594	\$1,927,062	\$1,542,075	1.25	\$2,504	\$2,596	1.04
1160	USAF CLINIC COMISO	488	\$1,797,636	\$1,053,320	1.71	551	\$1,868,480	\$1,572,621	1.19	\$2,111	\$2,854	1.35
1181	USAF CLINIC FLORENNES	333	1571482.604	1419695	1.1069	---	---	---	---	---	---	---
1947	USAF CLINIC GREENHAM COMMON	684	\$2,049,875	\$1,952,020	1.05	642	\$1,982,456	\$1,761,362	1.13	\$2,854	\$2,744	0.96
	USAF CLINICS	34,783	\$119,347,334	\$119,100,660	1.00	31,959	\$114,362,183	\$127,606,314	0.90	\$2,174	\$2,456	1.13

A review of observed expenses per MWU showed that some facilities displayed data instability in terms of unit costs between FY88 and FY89. In particular, 10 facilities reported greater than a 40 percent change in observed unit costs. Overall the data appear to be relatively stable between FY88 and FY89. The models, however, do not account for substantial changes in observed unit costs between fiscal years and estimates may be accurate for one fiscal year only in these cases.

Chapter 6.0 presents a methodology for projecting operations and maintenance (O&M) expenses within program element codes (PECs) 0807711 and 0807792 using the results of these MEPRS based expense models. The methodology for estimating O&M expenses is based on total MEPRS expenses at each facility rather than the three components of these expense models individually. The degree of accuracy to which the models estimate total expenses, rather than any one component, will determine the accuracy to which O&M expenses are estimated.



6.0 MODELING OPERATIONS AND MAINTENANCE EXPENSES

The DoD program/budgeting system is designed to integrate all resource aspects in developing and executing budgets. From a practical standpoint, however, the allocation and execution of healthcare program budgets tend to focus on the operation and maintenance (O&M) portion of the total budget. This chapter presents a methodology for the projection of O&M requirements based upon predicted expenses derived through the MEPRS cost models described in the previous chapters. This chapter is divided into three sections. The first section describes the development of an O&M multiplier based upon detailed financial data provided by the Services. The O&M multiplier provides an estimate of O&M expenses when applied to projected total MEPRS total inpatient and ambulatory expense. Section 6.2 illustrates the application of the O&M multiplier and provides a comparison of MTF-level predicted and observed O&M expenditures. Finally, section 6.3 provides a discussion of potential refinements to the O&M estimation approach that would improve sensitivity to expected changes in O&M expenditures at the MTF level.

6.1 DEVELOPMENT OF THE O&M MULTIPLIER

This section provides a discussion of two aspects of the O&M multiplier development. The underlying rationale for the development of the O&M multiplier is presented in the first subsection, while section 6.1.2 provides a detailed derivation of the O&M multiplier using Service financial data and projected MEPRS expenses.

6.1.1 RATIONALE UNDERLYING THE O&M MULTIPLIER DEVELOPMENT

The objective of the O&M multiplier is twofold:

- estimate requirements that fall under the DoD healthcare budget review process; and

- provide a linkage between case-mix sensitive MEPRS cost models that are comparable to other healthcare payment systems (e.g., Medicare, CHAMPUS) and the DoD budgeting process.

Each of these objectives is considered in greater detail below.

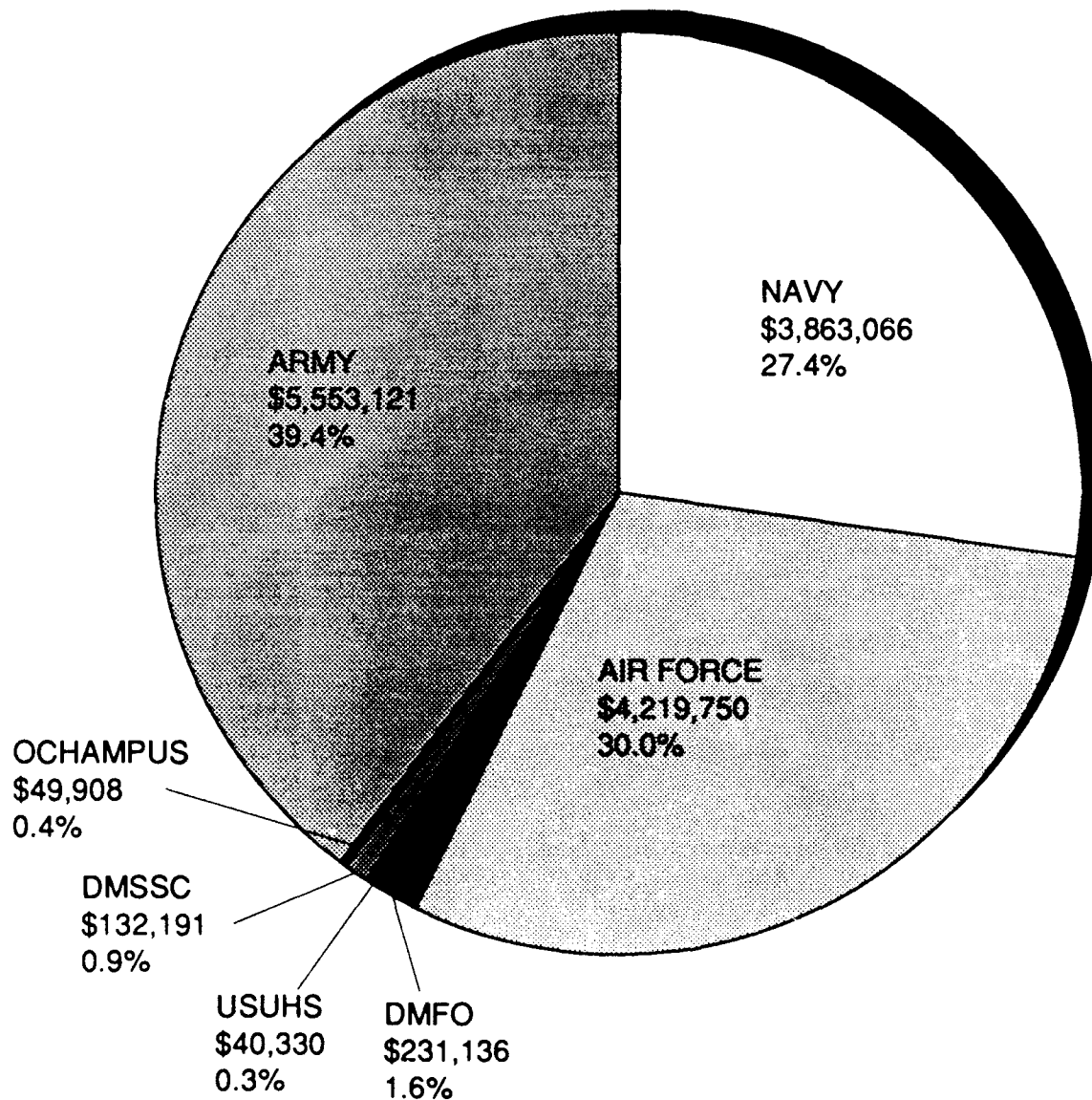
Estimate DoD Healthcare Budget Requirements

The O&M multiplier described below is geared toward both the DoD budget review process, as well as toward execution year review(s), both of which have historically focused on O&M expenditures. A review of the *Report on the Cost of Medical Activities*¹ clearly illustrates the relative share of the respective O&M components. Exhibit 6-1 illustrates the distribution of total FY90 DoD healthcare expenses by the seven DoD healthcare program segments (Army, Navy, Air Force, OCHAMPUS, DMFO, DMSSC, USUHS). Note that the OCHAMPUS, DMFO, DMSSC and USUHS components are directly managed by DoD while the Services manage their respective programs. The exhibit demonstrates the overwhelming share of the DoD healthcare budget represented by the Army, Navy and Air Force appropriations areas. Given the relative share of these appropriation areas and their direct relevance to MTF patient care, the multiplier is targeted toward them.

Exhibit 6-2 illustrates the object class distribution of healthcare expenses, focusing on the Army, Navy and Air Force appropriation areas. The exhibit illustrates that in total, O&M represented 54 percent of all Army, Navy and Air Force expenditures in FY90. Additional focus on the distribution of expenses within Army, Navy and Air Force O&M is provided in exhibit 6-3. The exhibit illustrates that outside of CHAMPUS expenditures (0807712), PECs 0807711 and 0807792 account for the majority of O&M expenses. In FY90, PECs 0807711 and 0807792 combined represent nearly 57 percent of the Army, Navy and Air Force O&M expenses (less

¹Published annually by OASD(HA) Health Budgets and Programs.

EXHIBIT 6-1: FY90 DoD HEALTHCARE EXPENSE DISTRIBUTION
BY APPROPRIATIONS AREA (\$000s)

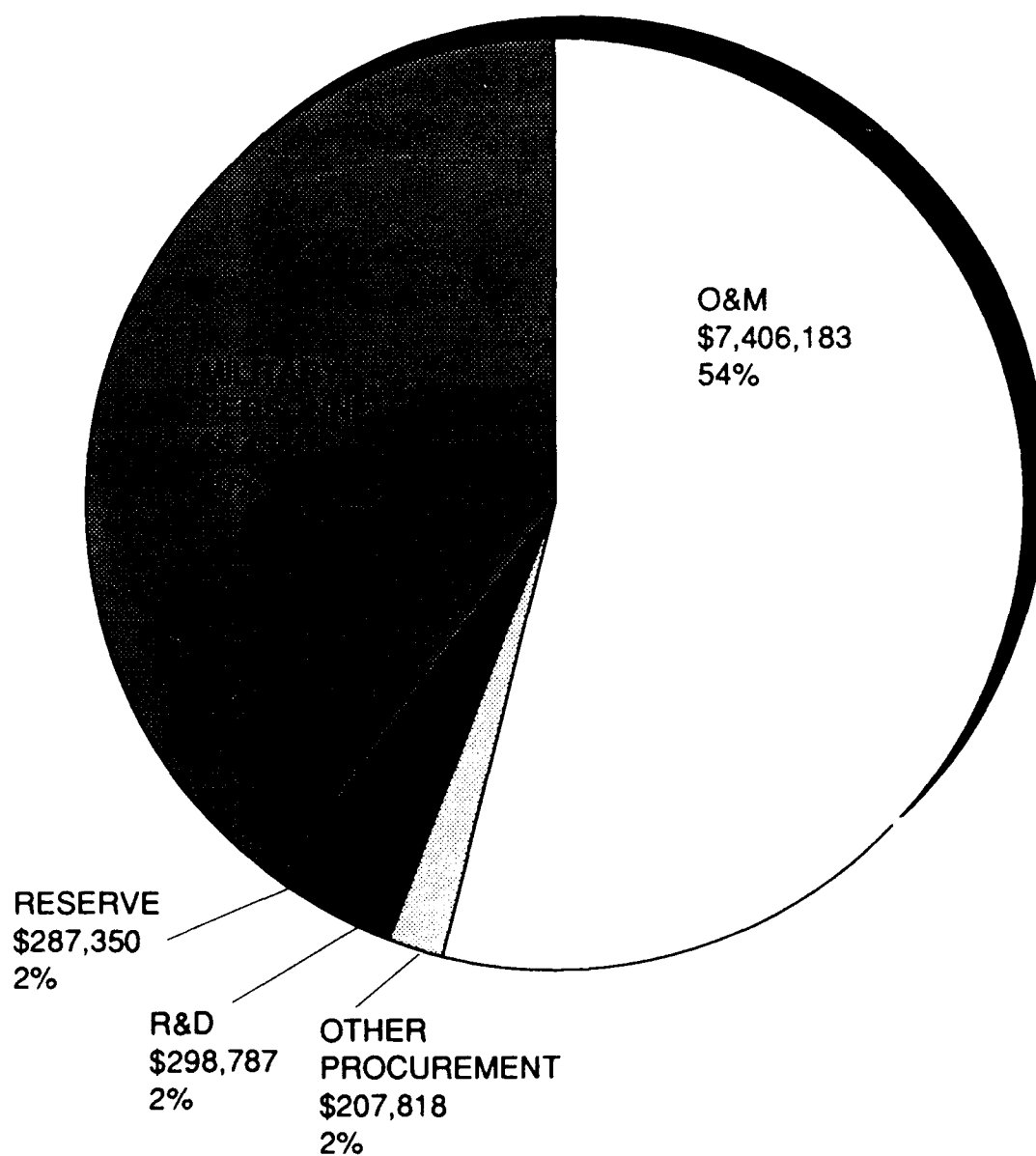


TOTAL DoD MEDICAL APPROPRIATIONS \$14,089,502

Source: OASD(HA) Report on the Cost of Medical Activities (COMA)

EXHIBIT 6-2: FY90 DoD HEALTHCARE EXPENSE DISTRIBUTION
BY OBJECT CLASS (\$000s)

ARMY, NAVY, AND AIR FORCE APPROPRIATIONS AREAS

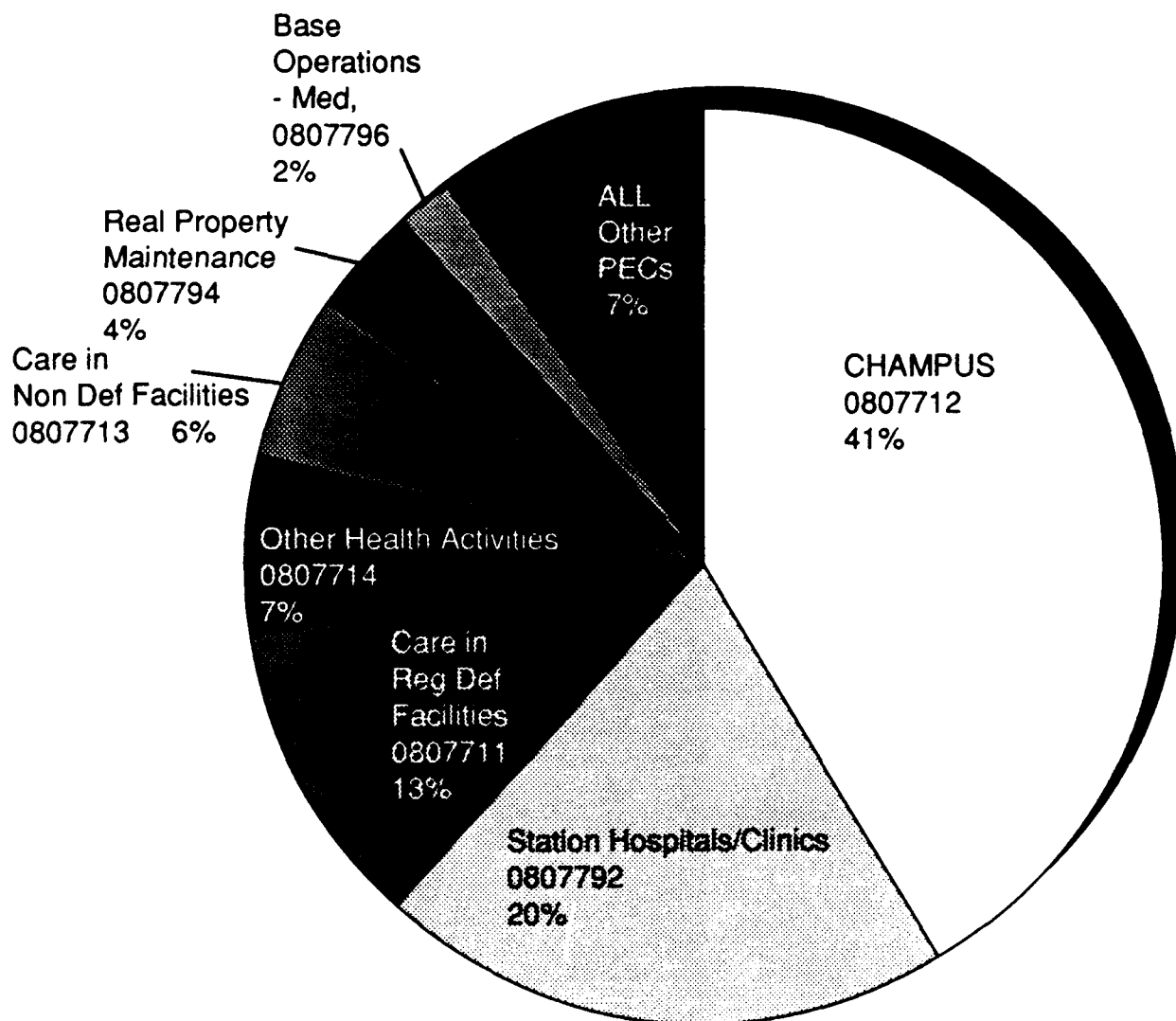


TOTAL ARMY, NAVY, AIR FORCE APPROPRIATIONS \$13,635,937

Source: OASD(HA) Report on the Cost of Medical Activities (COMA)

EXHIBIT 6-3: FY90 O&M EXPENSE DISTRIBUTION BY PROGRAM ELEMENT

ARMY, NAVY, AND AIR FORCE APPROPRIATIONS AREAS



Source: OASD(HA) Report on the Cost of Medical Activities (COMA)

CHAMPUS). These same two PECs accounted for over 23 percent of total military healthcare expenses for the three Services' appropriations areas in FY90. Exhibit 6-4 provides a complete listing of combined Army, Navy and Air Force expenditures by program element for the period FY88 - FY90. The exhibit is sorted based upon FY90 expenses, which underscores the fact that O&M expenditures are, for the most part, concentrated in just a few program elements. For example, the top six program elements in FY90 account for over 88 percent of all non-CHAMPUS O&M. The remaining 12 percent is spread out over nearly 25 program elements. The exhibit also illustrates that this pattern is quite stable over time. The FY88 and FY89 program elements fall into the same sort order as FY90, with minor exceptions.

The table below summarizes FY90 Army, Navy and Air Force O&M expenses in PECs 0807711 and 0807792 relative to other aspects of the DoD healthcare budget:

PECs 0807711 AND 0807792 RELATIVE TO THE DoD MEDICAL BUDGET
FY90

<u>BUDGET AREA</u>	<u>ARMY</u>	<u>NAVY</u>	<u>AIR FORCE</u>	<u>DoD</u>
Subtotal 0807711 & 0807792	\$1,085,894	\$ 613,508	\$ 764,682	\$ 2,464,084
Total O&M, less CHAMPUS	\$1,860,525	\$1,225,935	\$1,250,408	\$ 4,336,868
Total Medical, less CHAMPUS	\$4,581,376	\$2,728,666	\$3,256,580	\$10,566,622
Subtotal 0807711 & 0807792 % of Total O&M (less CHAMPUS)	58.36%	50.04%	61.15%	56.82%
Total O&M % of Total Medical (less CHAMPUS)	40.61%	44.93%	38.40%	41.04%
Subtotal 0807711 & 0807792 % of Total Medical (less CHAMPUS)	23.70%	22.48%	23.48%	23.32%

Source: OASD(HA) Report on the Cost of Medical Activities (COMA)

Clearly PECs 0807711 and 0807792 represent the majority of direct care O&M as well as a considerable portion of the *total* DoD healthcare expenses for all appropriation areas and all object classes. It is

EXHIBIT 6-4: FY88-FY90 ARMY, NAVY AND AIR FORCE EXPENSES BY PROGRAM ELEMENT

P. E. C.	Description	FY88 Expense (000's)	Percent Of FY88 Total	FY88 Cum Percent Less CHAMPUS	FY88 Expense (000's)	Percent Of FY88 Total	FY88 Cum Percent Less CHAMPUS	FY89 Expense (000's)	Percent Of FY89 Total	FY89 Cum Percent Less CHAMPUS	FY90 Expense (000's)	Percent Of FY90 Total	FY90 Cum Percent Less CHAMPUS
08077920807892	Station Hosp/Clinics	1,140,848	32.63%	32.63%	1,299,819	32.72%	32.72%	1,513,741	34.90%	34.90%	1,513,741	34.90%	34.90%
08077110807811	Care in Reg Del Facilities	694,649	19.87%	52.50%	813,543	20.48%	53.20%	950,343	21.91%	56.82%	950,343	21.91%	56.82%
08077140807814	Other Health Activities	414,154	11.85%	64.35%	431,788	10.87%	64.07%	481,935	11.11%	67.93%	481,935	11.11%	67.93%
08077130807813	Care in non Del Facilities	353,510	10.11%	74.46%	404,854	10.19%	74.26%	417,608	9.63%	77.56%	417,608	9.63%	77.56%
08077940807894	Fleet Property Maintenance	343,145	9.82%	84.28%	382,111	9.62%	83.89%	309,170	7.13%	84.69%	153,136	3.53%	88.22%
807786	Base Operations - Med	100,871	2.89%	87.16%	110,357	2.78%	86.66%	153,136	3.53%	88.22%	153,136	3.53%	88.22%
08077150807815	Dental Care	112,530	3.22%	90.38%	139,976	3.52%	90.18%	146,268	3.37%	91.59%	146,268	3.37%	91.59%
08067610806661	Education & Training	78,433	2.24%	92.63%	100,353	2.53%	92.71%	98,872	2.28%	93.87%	98,872	2.28%	93.87%
0806722	Armed Forces Hlth Prof Schlr Pgm	43,847	1.25%	93.88%	49,165	1.24%	93.94%	53,891	1.24%	95.11%	53,891	1.24%	95.11%
0202017	Tac Sup - Med Units	0	0.00%	93.88%	0	0.00%	93.94%	50,222	1.16%	96.27%	50,222	1.16%	96.27%
08077950807895	Base Communications - Med	23,447	0.67%	94.55%	26,586	0.67%	94.61%	29,240	0.67%	96.95%	29,240	0.67%	96.95%
0801713	Examining Activities	23,862	0.68%	95.23%	42,408	1.07%	95.68%	26,270	0.61%	97.55%	26,270	0.61%	97.55%
0807798	Management HQ - Med	22,101	0.63%	95.86%	21,939	0.55%	96.23%	22,433	0.52%	98.07%	22,433	0.52%	98.07%
0208032	Stock Fund War Reserve	8,577	0.25%	96.11%	9,913	0.25%	96.48%	22,260	0.51%	98.58%	22,260	0.51%	98.58%
0508897	Medical Support Units (AF)	27,889	0.80%	96.91%	21,145	0.53%	97.01%	18,936	0.44%	99.02%	18,936	0.44%	99.02%
08077900807890	Audiovisual Activities - Med	7,874	0.23%	97.13%	8,875	0.22%	97.24%	9,191	0.21%	99.23%	9,191	0.21%	99.23%
0508221	Medical Rediness Units (ANG)	7,246	0.21%	97.34%	7,595	0.19%	97.43%	7,755	0.18%	99.41%	7,755	0.18%	99.41%
0301311	Aeromed Evac Units	4,232	0.12%	97.46%	4,984	0.13%	97.55%	6,267	0.14%	99.55%	6,267	0.14%	99.55%
08022398	Armed Forces Med Intell Ctr	3,155	0.09%	97.55%	3,415	0.09%	97.64%	3,654	0.08%	99.64%	3,654	0.08%	99.64%
0408036	Management HQ	4,206	0.12%	97.67%	5,320	0.13%	97.77%	3,382	0.08%	99.72%	3,382	0.08%	99.72%
0505096	Sealift Enhancement (Surge)	856	0.02%	97.70%	635	0.02%	97.79%	2,760	0.06%	99.78%	2,760	0.06%	99.78%
0508211	Base Operations - Navy Res	0	0.00%	97.70%	0	0.00%	97.79%	2,689	0.06%	99.84%	2,689	0.06%	99.84%
0504216	Medical Service Units (AFR)	1,575	0.05%	97.74%	1,830	0.05%	97.84%	2,267	0.05%	99.89%	2,267	0.05%	99.89%
0508222	Aeromed Evacuation Units	4,092	0.12%	97.86%	4,375	0.11%	97.95%	1,716	0.04%	99.93%	1,716	0.04%	99.93%
0508112	Aeromed Evac Units (ANG)	805	0.02%	97.88%	1,084	0.03%	97.97%	1,001	0.02%	99.96%	1,001	0.02%	99.96%
0509598	Professional/Skills Prog Trng	0	0.00%	97.88%	0	0.00%	97.97%	913	0.02%	99.98%	913	0.02%	99.98%
0508213	Mgt HQ (Field Navy Res)	0	0.00%	97.88%	0	0.00%	97.97%	675	0.02%	99.99%	675	0.02%	99.99%
0701113	Med MOB Augmentees (AFR)	41	0.00%	97.88%	127	0.00%	97.98%	176	0.00%	100.00%	176	0.00%	100.00%
0202317	Procurement Operations	0	0.00%	97.88%	0	0.00%	97.98%	97	0.00%	100.00%	97	0.00%	100.00%
0202417	Tac Sup - Med Units - Europe	32,815	0.94%	98.82%	34,308	0.86%	98.84%	0	0.00%	100.00%	0	0.00%	100.00%
0202817	Tac Sup - Med Units - Pacific	2,659	0.08%	98.90%	2,782	0.07%	98.91%	0	0.00%	100.00%	0	0.00%	100.00%
0204996	Tac Sup - Med Units - FORSCOM	20,090	0.57%	99.47%	21,018	0.53%	99.44%	0	0.00%	100.00%	0	0.00%	100.00%
0401124	Tac Sup - Med Units - Surg Gen	18,324	0.52%	100.00%	19,163	0.48%	99.92%	0	0.00%	100.00%	0	0.00%	100.00%
0508697	Base Operations - Fleet Hosp	124	0.00%	100.00%	3,084	0.08%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
0806721	Aeromed Airlift Squadron	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
0807799	Medical Support Units (AFRNG)	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
0807791	USUHS	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
0808789	Drug Abuse Treatment Program	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
	DMFO	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
	Medical Information Systems	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
	Drug Abuse Prevention Program	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%	0	0.00%	100.00%
	TOTAL LESS CHAMPUS	3,495,957	100.00%	---	3,972,572	100.00%	---	4,336,868	100.00%	---	4,336,868	100.00%	---
0807712	CHAMPUS	2,557,672	---	---	2,630,566	---	---	3,069,315	---	---	3,069,315	---	---
	TOTAL DoD HEALTH CARE O&M	6,053,629	---	---	6,603,138	---	---	7,406,183	---	---	7,406,183	---	---

Source: OASD(HA) Report on the Cost of Medical Activities (COMA)

worth noting that the Service branch for which these two PECs represent the greatest portion of the budget varies considerably, dependent upon what part of the healthcare budget is used as the basis for reference. Relative to the share of the non-CHAMPUS O&M budget, the Air Force leads the way with PECs 0807711 and 0807792 representing 61 percent, Army 58 percent and Navy with 50 percent. Looking at all O&M (including CHAMPUS), the Navy has the greatest share (45 percent) and the Air Force the smallest share (38 percent). Finally, when the total healthcare budget for each Service is the basis for reference, the Army and Air Force show PECs 0807711 and 0807792 having a share of 24 percent. The Navy follows closely behind with these two PECs representing 23 percent of all healthcare expenses.

Provide a Linkage Between MEPRS and the DoD Healthcare Budgeting Process

The O&M multiplier approach presented in this chapter provides a mechanism that translates MEPRS expenses into terms comparable with Service financial data as well as DoD healthcare budget sources. This is a critical step in the DoD healthcare resourcing process for several reasons. First, MEPRS is the standardized system for healthcare workload and expenditure reporting within the MHSS. MEPRS tracks expenses and workloads that fully reflect direct and indirect healthcare expenses (i.e., ancillary services, support services). The inclusion of these indirect costs is essential for accurate cost comparisons with other prospective payment systems (e.g., CHAMPUS, Medicare), as noted in the previous chapters detailing MEPRS cost model development. Thus, MEPRS workloads and expenses serve as the cornerstone for the prospective resourcing of DoD healthcare requirements.

Equally important, cost models derived from MEPRS data provide the means of projecting resource requirements consistent with the provisions

of the Coordinated Care Program (CCP). For example, the MEPRS-based cost models can be used to project expected resource requirements for enrollees and non-enrollees, given projected workloads for these beneficiaries. Under the CCP, the MEPRS total cost models also establish an equitable, case-mix adjusted basis for augmenting catchment area-based resource allocations to reflect non-enrollee utilization in the form of referrals, emergency care, transient beneficiaries, etc. Resources attributable to these beneficiaries could be shifted between Services and the MTFs to reflect observed workload for these classes of beneficiaries. Further, it is anticipated that these models could also provide the basis for utilization-adjusted capitated rates for catchment area resourcing under CCP.

With these concepts in mind, it is clear that MEPRS-based expense projections can play an important role in support of CCP operations. However, projected MHSS resource requirements are necessary for comparison and review of Service budget requests, which are not expressed in MEPRS expense terms but instead in those of the DoD budgeting community. This fact underscores the need for a method of adjusting MEPRS-based expense projections to be consistent with the DoD budget structure. Further, adjustments of this nature will remain relevant until MEPRS system specifications are fully reconciled with the Service financial data systems and the Patient Level Cost Accounting (PLCA) initiative.¹

One approach to adjusting MEPRS-based projections would be to add or subtract the relevant PECs necessary to reconcile the MEPRS and financial data systems. However, at the present time, MEPRS data derived under the Expense Assignment System (EAS) II are not fully

¹An initial level of reconciliation will be provided by the EAS III modifications which are currently underway. EAS III is the expense step-down program which feeds MEPRS as is anticipated to provide pre-stepdown reconciliation of MEPRS workcenter costs by Program Element Code (PEC).

reconcilable with Service financial data.¹ This is principally due to the fact that the systems were designed independently and to meet divergent requirements. MEPRS was designed to track MTF/clinic expenses and workloads in a manner that fully reflects indirect costs and is consistent across the three Services. For example, Support Services are stratified in MEPRS to track nonreimbursable (summary account EC) and reimbursable (summary account ED) expenses. This provides a means of reconciling Army and Navy medical BOS (PEC 0807796) and Air Force RPM (PEC 0807794) at the local MTF level.

Although MEPRS account structure is sensitive to basic differences in the respective Service's financial systems, MEPRS was not designed to reconcile expenses in DoD budgeting terms.

Specifically, MEPRS was not designed to track expenses at the PEC level. This raises potential expense reconciliation problems given that MEPRS workcenters may contain one or more PECs, and conversely, one PEC may be found in one or more MEPRS workcenter. Some PECs under O&M do not fall under MEPRS inpatient and ambulatory accounts, as they do not directly relate to MTF-provided care (e.g., 0807712 and 0807713). While a large portion of PECs 0807711 and 0807792 are primarily expensed through inpatient and ambulatory accounts, PECs 0807794, 0807795, 0907796 are solely distributed to these areas by the EAS stepdown process. It should be noted that the Special Programs area within MEPRS is comprised of numerous PECs. Equally important, MEPRS includes expenses from object classes other than just O&M; military personnel, reserve, R&D, and other procurement expenses may also be included at the MTF level.

Given these inconsistencies, an approach was developed to relate MEPRS and the Services' financial data systems. This approach provides

¹MEPRS expenses are currently stepped down using the EAS II system.

estimates of expenses in terms comparable to DoD budget items, but does not require a complete *reconciliation* on a dollar-for-dollar basis between the two systems. Instead, the O&M multiplier relies upon a strong *correlation* between Service financial and MEPRS reported expenses by workcenter. This approach recognizes that some elements of expense are not necessarily directly related to inpatient and/or ambulatory care. Although this approach does not require reconciliation between the two systems, the extent to which definitional differences can be controlled will improve the predictive power of the O&M multiplier when used with projected MEPRS expenses. This issue is addressed in greater detail in section 6.3 which provides a discussion of potential enhancements to the current approach.

6.1.2 DEFINITION OF THE O&M MULTIPLIER

Detailed financial data provided by each of the Services were used as the basis for the O&M multiplier development. These data were provided by PEC, workcenter, and object class for each MTF.¹ Within PECs 0807711 and 0807792, all object classes excluding military personnel were selected to define O&M expenditures. As noted above, these two PECs represent the majority of non-CHAMPUS O&M and a significant portion of total healthcare expenses for the three Services. Section 6.3 of this document explores alternatives for expanding the scope of the multiplier beyond program elements 0807711 and 0807792. The O&M multiplier results presented in this section are based upon FY88 Service financial data unless otherwise noted. As complete FY89 and FY90 financial data

¹A complete description of the FY88 financial data set development is found in DoD Diagnosis Related Group (DRG) Financial Modeling and Biostatistical Refinement Study to Support Resource Allocation, Vector Research, Incorporated, VRI-HMS-1 WP90-4, 19 March 1990.

become available from the Services, the results presented in this section will be repeated to validate the approach and analyze its stability.

The O&M multiplier is defined as follows:

$$OM\%_i = \frac{OM\$_i}{MEPRS\$_i}$$

where:

$OM\%_i$ is the O&M multiplier for MTF i ;

$OM\$_i$ is the observed 0807711 and/or 0807792 O&M expense at MTF i ;
and

$MEPRS\$_i$ is the observed inpatient and ambulatory MEPRS expense at MTF i .

Thus, the O&M multiplier for a given MTF is simply the observed 0807711 and 0807792 O&M expenditures expressed as a ratio relative to the observed total MEPRS inpatient and ambulatory expenses for the MTF. The resultant ratio is applied to predicted MEPRS total inpatient and ambulatory expense to predict required PEC 0807711 and 0807792 O&M resources for each MTF.

The use of the O&M multiplier as defined above draws upon the fact that, although the MEPRS and financial systems cannot be fully reconciled by workcenter, the expenses tracked by each system are very highly correlated. It is recognized that significant accounting differences exist between MEPRS and the Services financial data systems. Although these differences preclude a precise reconciliation at this time between MEPRS expenses with Service budget information, the strong correlation demonstrated above provides the basis for the estimation of MTF-level O&M expenses. That is, O&M expenses can be predicted, based upon MEPRS expenses, even though expense data from the two systems cannot be fully reconciled.

To illustrate this relationship, 0807711 and 0807792 O&M expenses for FY88 were correlated with observed FY88 MEPRS inpatient and ambulatory expenses at each MTF. The aggregate results for each of the Services is presented below:

CORRELATION RESULTS
PECs 87711 & 87792 AND MEPRS INPATIENT AND AMBULATORY EXPENSE
FY88

<u>SERVICE BRANCH</u>	<u>Correlation Coefficient (r)</u>	<u>T VALUE</u>
Army	0.983	36.4
Navy	0.985	37.5
Air Force	0.976	48.8
DoD	0.969	57.3

All correlations were significant, $p < 0.0005$

As with any predictive model, some error will be present in the resultant O&M expense projections. The results to be presented in section 6.2 demonstrate that this error is relatively limited at the Service level.

The table below provides an overview of the resultant O&M multipliers, illustrating Service branch-level averages within each of the modeling peer groups.

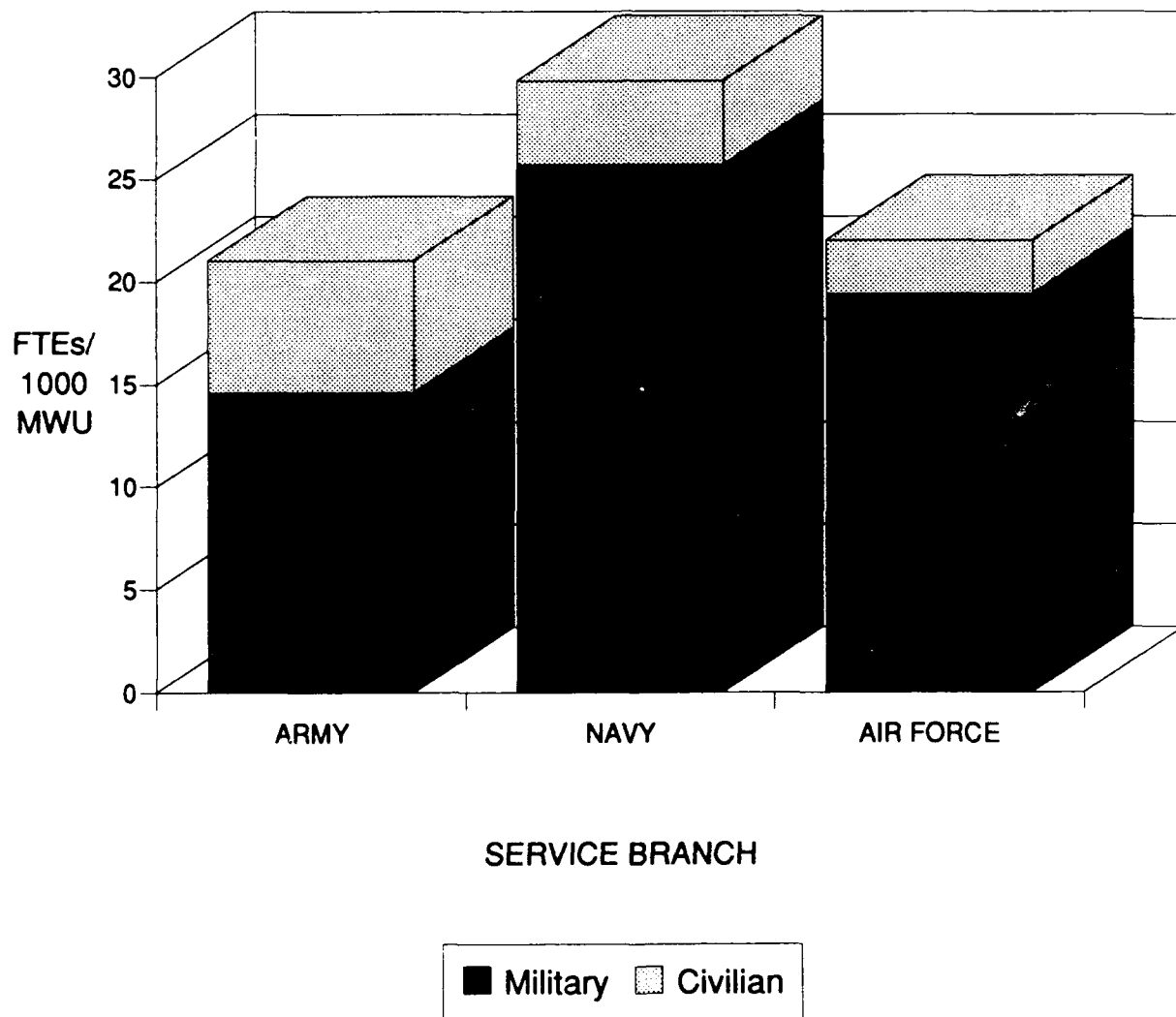
SUMMARY 0807711 AND 0807792 O&M MULTIPLIER RESULTS
FY88

<u>SERVICE BRANCH</u>	<u>OBSERVED O&M EXPENSES</u>	<u>OBSERVED MEPRS EXPENSES</u>	<u>O&M MULTIPLIER</u>
Army			
Medical Centers	\$344,222,700	\$ 743,260,572	46.3%
CONUS Comm. Hosps.	\$363,946,600	\$ 797,263,811	45.6%
Overseas Hospitals	\$158,474,400	\$ 352,797,205	44.9%
Clinics	\$ 6,766,200	\$ 11,017,878	61.4%
All Army Facilities	\$873,409,900	\$1,904,339,466	45.9%
Navy			
Medical Centers	\$142,965,088	\$ 405,439,822	35.3%
CONUS Comm. Hosps.	\$157,036,064	\$ 523,510,137	30.0%
Overseas Hospitals	\$ 33,678,257	\$ 134,845,247	25.0%
Clinics	\$ 30,686,964	\$ 96,982,653	31.6%
All Navy Facilities	\$364,366,373	\$1,160,777,859	31.4%
Air Force			
Medical Centers	\$213,568,898	\$ 584,620,459	36.5%
CONUS Comm. Hosps.	\$290,852,645	\$ 804,332,541	36.2%
Overseas Hospitals	\$ 36,528,377	\$ 158,505,841	23.0%
Clinics	\$ 43,143,775	\$ 116,107,126	37.2%
All Air Force Facilities	\$584,093,695	\$1,663,565,967	35.1%

Overall, the Army 0807711 and 0807792 O&M expenses are approximately 46 percent of total inpatient and ambulatory MEPRS expense, while Navy is 31 percent and Air Force 35 percent.

This finding is consistent with the typical staffing patterns observed for the three Services. The average Army share is relatively large since civilians are substituted for military personnel to a larger degree than the other two Services. Since civilian salaries are paid from O&M, the Army O&M share is proportionately greater. This is supported by a review of MEPRS full time equivalents (FTEs) for the inpatient and ambulatory clinical areas, relative to medical work units (MWUs). Exhibit 6-5 illustrates the share of military and civilian FTEs relative to FY88 MWUs for each Service Branch. Service averages are based upon all reporting MTFs excluding clinics. The exhibit confirms that Army MTFs utilize a greater degree of civilian resources relative to the Navy and Air Force. The table below illustrates that nearly 31 percent of Army inpatient and ambulatory FTEs were civilian FTEs in

**EXHIBIT 6-5: FULL TIME EQUIVALENTS (FTEs) PER
1000 MEDICAL WORK UNITS (MWUs) BY SERVICE
BRANCH FOR FY88***



*Average is based on Service averages excluding clinics.

FY88, a considerably higher level than the Navy (14 percent) or the Air Force (12 percent).

MEPRS INPATIENT AND AMBULATORY FULL TIME EQUIVALENTS (FTEs)
FY88

	<u>MILITARY FTEs</u>	<u>CIVILIAN FTEs</u>	<u>TOTAL FTEs</u>	<u>% MILITARY</u>	<u>% CIVILIAN</u>
Army	13,472	5,923	19,395	69.46%	30.53%
Navy	10,134	1,600	11,734	86.36%	13.64%
Air Force	13,442	1,819	15,261	88.08%	11.92%
Total	37,048	9,342	46,391	79.86%	20.14%

Thus, the relatively large Army O&M multiplier is reflective of the historical staffing mix observed via MEPRS.

Exhibits 6-6 through 6-9 provide detailed MTF-level results of the O&M multiplier for medical centers, CONUS community hospitals, overseas hospitals, and clinics, respectively. The exhibits illustrate that the O&M multiplier varies considerably within several of the respective modeling categories. Army medical centers range from 41 percent (Tripler AMC) to 52 percent (Walter Reed AMC) while Army CONUS community hospitals range from 21 percent (Weed AH, Ft. Irwin) to 59 percent (Fox AH, Redstone Arsenal). Army Overseas hospitals ranged from 27 percent (45th Field Hosp., Vicenza) to 77 percent (Gorgas AH). For the Navy, medical centers varied from 31 percent (NH Portsmouth) to 39 percent (NH San Diego) while CONUS community hospitals ranged from 13 percent (Adak) to 40 percent (NH Oak Harbor). The variation within Navy overseas hospitals was less, ranging from 17 (NH Guantanamo Bay) to 29 percent (NH Okinawa, NH Yokosuka). The variation at Navy clinics was from 1 percent (NMCL London) to 59 percent (NMCL Norfolk). The range for Air Force medical centers was 32 percent (Wilford Hall) to 44 percent (Wright-Patterson), for community hospitals 24 percent (George, Shaw, Mountain Home, and Ellsworth AFB) to 57 percent (Seymour Johnson), and from 15 percent (Kunsan AFB) to 38 percent (Torrejon) for overseas facilities. For clinics, the factors range from 18 percent (McChord) to 212 percent

EXHIBIT 6-6: FY88 MEDICAL CENTER O & M (0807711 & 0807792) MULTIPLIER DERIVATION

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 O & M MULTIPLIER
22	LETTERMAN AMC-PRESIDIO OF SF	\$36,322,600	\$16,700,100	\$14,035,500	\$4,713,200	\$515,400	\$35,964,200	\$78,105,499	46.0%
31	FITZSIMONS AMC-DENVER	\$66,686,300	\$19,809,100	\$17,124,400	\$6,169,800	\$562,300	\$43,665,600	\$105,911,413	41.2%
37	WALTER REED AMC-WASHINGTON	\$95,143,200	\$50,923,000	\$30,303,500	\$4,934,700	\$1,551,100	\$97,712,300	\$169,495,672	51.7%
47	EISENHOWER AMC-FT GORDON	\$42,881,100	\$17,101,700	\$13,828,300	\$5,307,900	\$385,800	\$36,623,700	\$90,758,467	45.3%
52	TRIPLER AMC-FT SHAFTER	\$64,382,600	\$26,854,600	\$17,026,300	\$5,531,300	\$863,800	\$60,278,000	\$123,474,521	40.7%
108	WILLIAM BEAUMONT AMC-FT BLISS	\$40,114,500	\$21,740,100	\$16,810,300	\$2,201,400	\$692,300	\$41,444,100	\$99,589,710	46.3%
125	MADIGAN AMC-FT LEWIS	\$44,509,900	\$19,571,900	\$16,602,000	\$11,716,100	\$644,800	\$48,534,800	\$95,925,280	50.6%
	ARMY MEDICAL CENTERS	\$390,020,200	\$173,700,500	\$125,732,300	\$40,574,400	\$5,215,500	\$344,222,700	\$743,260,572	46.3%
27	NH OAKLAND	\$44,930,047	\$7,527,537	\$10,051,564	\$2,273,889	\$1,764,241	\$21,617,031	\$61,900,905	34.9%
29	NH SAN DIEGO	\$81,651,807	\$17,459,965	\$25,321,487	\$7,094,570	\$102,228	\$49,978,250	\$127,076,572	39.3%
67	NH BETHESDA	\$60,832,782	\$14,902,790	\$18,574,908	\$5,183,881	(\$401,718)	\$38,259,661	\$108,348,603	35.3%
124	NH PORTSMOUTH	\$65,465,871	\$9,366,691	\$15,714,132	\$7,610,205	\$419,118	\$33,110,146	\$108,113,742	33.6%
	NAVY MEDICAL CENTERS	\$232,880,487	\$49,259,983	\$89,682,091	\$22,162,145	\$1,883,869	\$142,065,088	\$405,439,822	35.3%
14	DAVID GRANT MED CTR-TRAVIS	\$32,780,357	\$5,325,445	\$11,218,308	\$2,106,483	\$1,541,989	\$20,192,225	\$56,102,335	36.0%
55	USAF MED CTR SCOTT	\$26,513,043	\$4,458,866	\$8,726,079	\$1,356,495	\$564,670	\$15,106,110	\$42,299,345	35.7%
66	MALCOM GROW MED CTR-ANDREWS	\$43,274,953	\$6,580,741	\$9,550,879	\$1,351,164	\$902,304	\$18,385,088	\$53,902,435	34.1%
73	USAF MED CTR KEESLER	\$42,591,573	\$4,947,546	\$13,775,608	\$1,776,639	\$981,069	\$21,480,882	\$65,686,653	32.7%
95	USAF MED CTR WRIGHT-PATTERSON	\$41,543,412	\$8,034,036	\$11,838,958	\$4,318,714	\$1,554,141	\$25,745,849	\$57,954,243	44.4%
109	BROOKE AMC (JMMC)-FT SAM HOUSTON	\$0	\$24,988,742	\$24,801,140	\$5,117,470	\$623,852	\$55,532,204	\$128,013,281	43.4%
117	WILFORD HALL MED CTR-LACKLAND	\$81,237,121	\$15,165,790	\$31,338,404	\$8,189,557	\$2,432,809	\$57,126,560	\$180,662,167	31.6%
	USAF MEDICAL CENTERS	\$287,940,359	\$49,502,166	\$111,249,376	\$24,216,522	\$8,600,834	\$213,568,898	\$584,620,459	36.3%

NOTE: Expenses and workload within the PRIMUS/NAVCARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

EXHIBIT 6-7: FY88 CONUS COMMUNITY HOSPITAL O & M (0807711 & 0807792) MULTIPLIER DERIVATION

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 O & M MULTIPLIER
1	FOX AH-REDSTONE ARSENAL	\$4,469,000	\$4,209,000	\$1,837,300	\$238,300	\$62,800	\$6,347,400	\$10,692,343	59.4%
2	NOBLE AH-FT MCLELLAN	\$7,790,900	\$4,425,400	\$2,966,800	\$882,900	\$96,400	\$8,371,500	\$15,313,695	54.7%
3	LYSTER AH-FT RUCKER	\$10,119,200	\$4,063,800	\$3,658,400	\$893,500	\$137,500	\$8,751,200	\$19,243,401	45.5%
5	BASSETT ACH-FT WAINWRIGHT	\$12,884,000	\$1,560,600	\$2,078,800	\$1,544,500	\$349,000	\$5,532,900	\$19,393,156	28.5%
8	BLISS AH-FT HUACHUCA	\$9,266,700	\$4,472,400	\$2,419,200	\$673,800	\$217,100	\$7,782,500	\$17,102,319	45.5%
23	HAYS AH-FT ORD	\$21,284,600	\$8,858,600	\$6,378,500	\$3,062,000	\$233,400	\$18,532,500	\$42,995,293	43.1%
32	EVANS AH-FT CARSON	\$18,427,800	\$9,643,300	\$6,445,400	\$1,804,600	\$129,000	\$17,822,300	\$35,899,066	49.6%
48	MARTIN AH-FT BENNING	\$23,415,000	\$14,507,500	\$7,913,500	\$868,500	\$217,200	\$23,504,700	\$50,185,652	48.8%
49	WINN AH-FT STEWART	\$17,089,900	\$6,243,300	\$4,026,700	\$1,367,700	\$128,600	\$11,766,300	\$30,801,431	38.2%
57	IRWIN AH-FT RILEY	\$14,705,500	\$9,295,000	\$3,734,500	\$563,400	\$78,500	\$12,671,400	\$30,668,589	41.3%
58	MAUNSON AH-FT LEAVENWORTH	\$7,919,800	\$3,694,200	\$2,432,400	\$659,700	\$78,000	\$6,984,300	\$14,735,831	46.6%
80	BLANCHFIELD ACH-FT CAMPBELL	\$16,738,100	\$10,548,900	\$5,676,900	\$1,818,000	\$98,000	\$16,138,900	\$41,158,881	44.1%
81	IRELAND AH-FT KNOX	\$16,195,800	\$10,088,100	\$6,739,300	\$1,119,200	\$150,300	\$17,890,700	\$37,016,698	48.3%
84	GAYNE-JONES AH-FT POLK	\$14,814,300	\$6,907,200	\$3,894,200	\$1,319,000	\$147,200	\$12,267,600	\$27,917,268	43.9%
86	KIMBROUGH AH-FT MEADE	\$13,403,500	\$6,342,800	\$4,608,100	\$1,920,200	\$416,300	\$15,285,200	\$29,958,533	51.0%
70	CUTLER AH-FT DEVENS	\$9,378,800	\$3,830,100	\$2,189,600	\$994,300	\$171,300	\$7,185,300	\$14,193,291	50.6%
75	WOOD AH-FT LEONARD WOOD	\$20,014,700	\$10,023,800	\$6,429,100	\$2,649,100	\$199,200	\$19,301,200	\$38,668,168	49.9%
81	PATTERSON AH-FT MONMOUTH	\$3,379,700	\$3,952,800	\$2,018,200	\$1,003,800	\$111,400	\$7,086,300	\$14,590,658	48.6%
82	WALSON AH-FT DIX	\$20,492,500	\$9,084,800	\$4,136,800	\$1,812,100	\$123,800	\$13,957,600	\$33,281,636	41.9%
86	KELLER AH-FT WEST POINT	\$8,711,400	\$3,589,300	\$2,443,900	\$594,200	\$101,700	\$6,729,100	\$15,681,071	42.9%
88	WOMACK AH-FT BRAGG	\$29,968,700	\$12,087,500	\$9,891,100	\$2,481,200	\$167,800	\$24,627,600	\$53,147,327	46.3%
98	REYNOLDS AH-FT SILL	\$18,329,600	\$8,057,400	\$4,967,500	\$1,753,700	\$140,300	\$14,918,500	\$34,065,693	43.8%
105	MONCRIEF AH-FT JACKSON	\$17,755,200	\$8,466,700	\$5,731,200	\$1,413,000	\$164,100	\$15,775,000	\$32,998,267	47.8%
110	DARNALL AH-FT HOOD	\$27,343,700	\$12,933,600	\$9,417,200	\$2,524,100	\$297,800	\$25,172,800	\$54,534,887	48.2%
121	MCDONALD AH-FT EUSTIS	\$6,123,100	\$6,097,400	\$3,080,800	\$986,500	\$62,300	\$9,227,000	\$18,042,169	51.1%
122	KENNER AH-FT LEE	\$8,391,900	\$6,202,000	\$2,710,500	\$717,200	\$104,900	\$8,734,600	\$17,319,830	50.4%
123	DEWITT AH-FT BELVOIR	\$17,075,500	\$7,289,800	\$4,361,100	\$1,978,700	\$323,200	\$13,952,800	\$30,201,106	46.2%
131	WEED ACH-FT IRWIN	\$6,090,100	\$737,200	\$740,100	\$567,800	\$17,200	\$2,062,300	\$9,848,517	20.9%
294	HAWLEY AH-FT B. HARRISON	\$3,980,500	\$2,136,800	\$1,390,500	\$99,400	\$60,400	\$3,687,100	\$7,609,235	48.5%
	ARMY CONUS COMMUNITY HOSPITALS	\$404,534,300	\$198,139,700	\$123,313,700	\$37,908,400	\$4,584,800	\$363,946,600	\$797,263,811	45.6%
7	BRH NAVSTA ADAK	\$3,142,745	\$56,652	\$283,013	\$50,073	\$132,873	\$522,611	\$4,169,325	12.5%
24	NH CAMP PENDLETON	\$28,039,000	\$5,360,961	\$6,055,975	\$1,572,959	\$63,775	\$13,053,670	\$43,046,485	30.3%
25	NH LONG BEACH	\$24,772,996	\$4,724,926	\$5,252,842	\$1,351,368	\$189,419	\$11,517,555	\$40,773,748	28.2%
28	NH LEMOORE	\$6,073,172	\$487,317	\$1,348,547	\$287,803	\$58,885	\$2,182,552	\$9,586,617	22.8%
30	BRH MCAGCC TWENTY NINE PALMS	\$3,786,416	\$428,948	\$939,267	\$227,414	\$213,426	\$1,709,055	\$6,663,907	25.6%
35	NH GROTON	\$14,410,772	\$1,230,805	\$2,659,420	\$1,224,688	\$343,335	\$5,458,248	\$22,643,457	24.1%
38	NH PENSACOLA	\$25,111,679	\$4,738,124	\$6,473,655	\$2,051,710	\$108,520	\$13,372,009	\$40,561,117	33.0%
39	NH JACKSONVILLE	\$34,596,095	\$3,899,728	\$6,347,492	\$2,586,926	\$16,401	\$14,844,547	\$53,177,833	27.9%
40	NH ORLANDO	\$19,672,700	\$3,485,662	\$6,009,798	\$1,302,298	\$53,824	\$10,851,523	\$33,031,141	32.9%
56	NH GREAT LAKES	\$30,794,126	\$3,480,115	\$6,755,916	\$3,877,171	\$116,865	\$14,230,067	\$47,803,088	29.8%
68	NH PATUXENT RIVER	\$4,444,168	\$999,313	\$928,338	\$132,585	\$241,887	\$2,202,123	\$5,790,371	38.0%
91	NH CAMP LEJEUNE	\$20,816,066	\$4,162,888	\$5,808,998	\$940,047	\$187,196	\$11,099,129	\$33,528,225	33.1%
92	NH CHERRY POINT	\$6,751,467	\$965,616	\$1,928,429	\$488,186	\$334,850	\$3,717,081	\$11,474,362	32.4%

Continued

EXHIBIT 6-7: FY88 CONUS COMMUNITY HOSPITAL O & M (0807711 & 0807792) MULTIPLIER DERIVATION
(Continued)

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 O & M MULTIPLIER
99	NH PHILADELPHIA	\$14,105,130	\$2,009,321	\$2,914,505	\$1,467,629	\$456,805	\$6,838,260	\$21,259,783	32.2%
100	NH NEWPORT	\$11,202,986	\$2,262,824	\$2,688,867	\$372,572	\$238,736	\$5,582,025	\$19,950,025	27.9%
103	NH CHARLESTON	\$23,324,112	\$2,960,433	\$5,419,824	\$3,423,450	\$462,390	\$12,265,897	\$36,964,633	33.2%
104	NH BEAUFORT	\$11,271,568	\$1,209,059	\$2,380,825	\$1,583,261	\$119,494	\$5,292,639	\$20,009,234	26.5%
107	NH MILLINGTON	\$15,186,967	\$1,717,722	\$2,787,135	\$946,979	\$130,588	\$6,582,424	\$22,852,505	24.4%
118	NH CORPUS CHRISTI	\$9,707,215	\$894,944	\$1,852,743	\$948,818	\$151,995	\$3,848,500	\$17,061,208	22.6%
128	NH BREMERTON	\$14,930,009	\$3,936,733	\$4,128,867	\$1,411,653	\$320,722	\$9,791,975	\$25,371,266	38.6%
127	NH OAK HARBOR	\$4,929,327	\$699,023	\$1,201,167	\$874,039	\$223,141	\$3,087,370	\$7,761,807	38.6%
	NAVY CONUS COMMUNITY HOSPITALS	\$325,267,715	\$40,610,914	\$76,149,393	\$27,111,630	\$4,164,127	\$157,039,064	\$523,510,137	30.0%
4	AIR UNIVERSITY RGN HOSP-MAXWELL	\$14,612,523	\$1,453,032	\$4,908,250	\$607,861	\$270,540	\$7,569,683	\$18,968,993	39.9%
6	USAF HOSP ELMENDORF	\$18,626,796	\$2,175,113	\$4,083,723	\$1,213,926	\$964,680	\$6,437,442	\$27,535,617	30.6%
9	832nd MED GRP-LUKE	\$12,599,240	\$1,683,365	\$4,458,087	\$558,147	\$168,997	\$6,868,476	\$18,277,242	37.6%
10	826th MED GRP-DAVIS MONTHAN	\$9,724,918	\$2,088,384	\$3,816,189	\$1,473,615	\$247,261	\$7,625,449	\$20,352,947	37.5%
11	USAF HOSP WILLIAMS	\$6,634,597	\$1,102,578	\$1,704,207	\$405,505	\$210,290	\$3,422,580	\$12,085,785	28.3%
12	97th STRAT HOSP-EAKER	\$5,274,554	\$692,089	\$1,234,599	\$488,681	\$262,941	\$2,578,290	\$7,835,519	32.9%
13	USAF HOSP LITTLE ROCK	\$7,184,123	\$760,660	\$2,406,495	\$269,420	\$139,020	\$3,575,015	\$11,098,924	32.2%
15	9th STRAT HOSP-BEALE	\$7,519,030	\$715,216	\$1,659,104	\$303,034	\$235,024	\$3,112,378	\$10,210,767	30.5%
16	USAF HOSP MATHER	\$13,672,781	\$1,736,050	\$3,509,135	\$478,113	\$342,540	\$6,065,838	\$19,528,963	31.1%
17	93rd STRAT HOSP-CASTLE	\$7,565,732	\$914,928	\$1,817,269	\$200,830	\$317,480	\$3,174,480	\$10,299,802	30.8%
18	1st STRAT HOSP-VANDENBERG	\$8,921,733	\$808,515	\$1,915,545	\$1,593,144	\$278,658	\$4,594,062	\$11,116,010	41.3%
19	USAF HOSP EDWARDS	\$7,152,197	\$736,405	\$1,341,262	\$471,480	\$301,678	\$2,860,813	\$9,103,178	31.3%
20	831st MED GRP-GEORGE	\$7,375,530	\$697,118	\$1,384,659	\$358,196	\$124,058	\$2,464,031	\$10,149,184	24.3%
21	22nd STRAT HOSP-MARCH	\$16,980,768	\$1,490,314	\$4,706,159	\$1,559,795	\$409,809	\$8,166,017	\$23,487,242	34.8%
33	USAF ACADEMY HOSP	\$15,877,187	\$1,839,262	\$4,860,434	\$788,359	\$441,278	\$7,907,333	\$25,333,683	31.2%
36	USAF HOSP DOVER	\$7,875,220	\$969,055	\$2,248,158	\$389,126	\$211,948	\$3,818,297	\$9,560,288	39.9%
42	USAF RGN HOSP EGLIN	\$24,992,021	\$3,406,215	\$7,875,545	\$1,200,577	\$673,213	\$13,055,550	\$37,159,946	35.1%
43	325th MED GRP-TYNDALL	\$2,429,303	\$1,437,177	\$3,334,846	\$1,115,781	\$369,375	\$6,256,959	\$14,676,026	42.6%
44	31st MED GRP-HOMESTEAD	\$12,666,240	\$1,318,807	\$3,598,518	\$1,006,963	\$267,167	\$6,191,255	\$18,037,974	34.3%
45	58th MED GRP-MACDILL	\$10,686,191	\$1,745,767	\$7,350,001	\$1,644,884	\$360,851	\$11,101,483	\$22,033,143	50.4%
46	USAF HOSP PATRICK	\$6,900,091	\$1,496,649	\$3,395,023	\$836,636	\$410,742	\$6,139,050	\$11,565,358	53.1%
50	347th MED GRP-MOODY	\$6,203,358	\$751,672	\$1,550,661	\$412,456	\$192,047	\$2,908,836	\$9,577,641	30.4%
51	USAF HOSP ROBINS	\$6,917,883	\$1,181,675	\$2,087,119	\$374,444	\$234,948	\$3,878,186	\$11,688,187	33.2%
53	368th MED GRP-MOUNTAIN HOME	\$6,092,652	\$0	\$1,284,711	\$392,659	\$310,224	\$1,987,594	\$8,427,919	23.6%
54	USAF HOSP CHANUTE	\$7,511,039	\$1,147,517	\$1,842,623	\$701,821	\$319,501	\$3,811,462	\$10,151,221	37.5%
59	384th STRAT HOSP-MCCONNELL	\$4,624,462	\$616,387	\$1,041,038	\$156,343	\$156,343	\$2,231,094	\$6,705,822	33.3%
62	2nd STRAT HOSP-BARKSDALE	\$11,280,087	\$1,817,295	\$3,804,585	\$650,840	\$291,005	\$5,563,725	\$16,123,081	40.7%
63	23rd MED GRP-ENGLAND	\$2,678,501	\$789,467	\$1,586,773	\$310,165	\$334,250	\$3,020,655	\$9,149,773	33.0%
65	42nd STRAT HOSP-LORING	\$5,445,355	\$439,432	\$953,566	\$326,459	\$625,816	\$2,345,273	\$6,444,248	36.4%
71	379th STRAT HOSP-WURTSMITH	\$6,625,386	\$490,401	\$1,290,564	\$439,374	\$288,523	\$2,508,862	\$8,069,347	31.1%
72	410th STRAT HOSP-KILSAWYER	\$5,537,453	\$658,268	\$1,076,306	\$184,252	\$244,909	\$2,449,090	\$7,961,449	30.8%
74	USAF HOSP COLUMBUS	\$4,829,576	\$464,719	\$911,610	\$292,289	\$192,402	\$1,761,020	\$6,339,130	27.8%
76	351st STRAT HOSP-WHEATMAN	\$3,474,768	\$616,785	\$1,177,446	\$468,854	\$195,549	\$2,458,479	\$7,808,479	31.5%
77	341st STRAT HOSP-MALMSTROM	\$5,299,821	\$489,321	\$1,069,994	\$461,843	\$265,365	\$2,286,523	\$6,823,523	33.5%
78	EMERLING BE ROUQUET RGN HOSP-OFFUTT	\$17,308,905	\$2,494,361	\$5,323,257	\$1,893,091	\$460,550	\$10,161,259	\$23,031,236	43.1%

Continued

EXHIBIT 6-7: FY88 CONUS COMMUNITY HOSPITAL O & M (0807711 & 0807792) MULTIPLIER DERIVATION
(Concluded)

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 O & M MULTIPLIER
79	564th MED GRP-NELLIS	\$10,362,232	\$1,068,756	\$3,375,318	\$658,861	\$328,520	\$5,631,454	\$14,779,060	38.1%
80	509th STRAT HOSP-PEASE	\$9,293,369	\$1,426,691	\$2,554,713	\$709,394	\$275,473	\$4,966,271	\$13,780,744	36.0%
83	USAF HOSP KIRTLAND	\$9,490,776	\$1,471,485	\$2,826,723	\$2,000,952	\$428,215	\$6,527,375	\$14,839,419	44.0%
84	833rd MED GRP-HOLLOMAN	\$6,915,310	\$782,913	\$1,584,808	\$203,008	\$294,298	\$2,865,027	\$9,873,043	28.0%
86	27th MED GRP-CANNON	\$6,861,411	\$692,050	\$1,339,213	\$481,258	\$250,742	\$2,643,263	\$9,010,615	29.3%
87	390th STRAT HOSP-PLATTSBURGH	\$4,104,588	\$700,839	\$1,203,413	\$466,584	\$210,472	\$2,571,108	\$7,179,024	35.8%
88	416th STRAT HOSP-GRIFFISS	\$5,924,866	\$1,053,158	\$1,301,068	\$675,601	\$262,091	\$3,281,908	\$9,165,193	35.9%
90	4th MED GRP-SEYMOUR JOHNSON	\$7,426,192	\$987,967	\$3,452,522	\$361,064	\$216,193	\$4,907,746	\$8,599,416	57.1%
93	842nd STRAT HOSP-GRAND FORKS	\$6,072,074	\$773,303	\$1,125,237	\$448,984	\$230,349	\$2,577,873	\$8,573,747	30.1%
94	867th STRAT HOSP-MINOT	\$7,945,943	\$1,327,956	\$1,992,543	\$626,743	\$713,905	\$4,661,147	\$11,430,440	40.8%
96	USAF HOSP TINKER	\$9,270,224	\$1,794,244	\$3,526,100	\$972,735	\$219,002	\$6,512,081	\$13,930,307	46.7%
97	USAF HOSP ALTUS	\$5,761,595	\$702,556	\$1,185,239	\$462,128	\$159,086	\$2,499,009	\$7,405,695	33.7%
101	383rd MED GRP-SHAW	\$8,542,746	\$1,105,776	\$2,292,545	\$674,390	\$357,087	\$4,429,798	\$18,556,608	23.9%
102	364th MED GRP-MYRTLE BEACH	\$5,543,597	\$433,255	\$1,485,139	\$540,827	\$204,245	\$2,663,466	\$8,176,853	32.6%
106	44th STRAT HOSP-ELLSWORTH	\$9,227,657	\$714,184	\$1,481,008	\$347,156	\$136,446	\$2,678,792	\$11,268,272	23.8%
111	USAF HOSP REESE	\$4,768,884	\$632,800	\$728,854	\$590,256	\$161,078	\$2,112,788	\$5,074,133	35.4%
112	98th STRAT HOSP-DYESS	\$7,576,831	\$1,076,094	\$2,254,822	\$639,084	\$328,562	\$4,298,362	\$11,517,238	37.3%
113	USAF RGN HOSP SHEPPARD	\$17,715,503	\$2,294,135	\$3,799,828	\$1,093,661	\$693,368	\$7,780,962	\$24,784,264	31.4%
114	USAF HOSP LAUGHLIN	\$5,025,019	\$248,179	\$773,095	\$263,853	\$114,768	\$1,389,895	\$5,681,230	24.5%
115	67th MED GRP-BERGSTROM	\$8,022,936	\$918,751	\$3,491,835	\$505,603	\$243,398	\$6,159,587	\$12,155,016	42.4%
116	R. THOMPSON STRAT HOSP-CARSWELL	\$13,153,044	\$2,709,627	\$6,806,269	\$1,847,719	\$2,054,569	\$15,018,224	\$34,334,349	43.7%
119	USAF HOSP HILL	\$7,917,108	\$1,791,541	\$2,684,123	\$995,597	\$188,169	\$5,659,430	\$10,707,124	52.9%
120	1st MED GRP-LANGLEY	\$15,627,029	\$2,102,254	\$4,766,488	\$1,386,669	\$683,761	\$8,639,170	\$22,964,825	38.9%
128	82nd STRAT HOSP-FAIRCHILD	\$8,328,858	\$1,239,104	\$2,595,577	\$1,162,554	\$287,408	\$5,284,643	\$13,432,421	39.3%
129	90th STRAT HOSP-F.E. WARREN	\$6,431,214	\$696,719	\$1,227,700	\$444,048	\$170,070	\$2,438,537	\$9,495,858	25.7%
	USAF CONUS COMMUNITY HOSPITALS	\$524,198,655	\$69,467,745	\$157,961,217	\$43,432,987	\$19,990,696	\$290,852,645	\$804,332,541	36.2%

NOTE: Expenses and workload within the PRIMUS/NAV/CARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

EXHIBIT 6-8: FY88 OVERSEAS HOSPITAL O & M (0807711 & 0807792) MULTIPLIER DERIVATION

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSES	FY88 O & M MULTIPLIER
601	34th GENERAL HOSP-AUGSBURG	\$11,004,000	\$6,750,000	\$2,193,000	\$518,000	\$133,000	\$9,594,000	\$21,304,054	45.0%
602	5th GENERAL HOSP-BAD CANNSTATT	\$18,210,000	\$8,141,000	\$2,688,000	\$298,000	\$328,000	\$11,455,000	\$30,825,287	37.2%
603	AH BERLIN								
604	2nd FIELD HOSP-BREMERHAVEN	\$6,758,000	\$3,308,000	\$1,287,000	\$100,000	\$279,000	\$4,974,000	\$11,782,254	42.3%
605	97th GENERAL HOSP-FRANKFURT	\$34,905,000	\$17,398,000	\$7,457,000	\$2,531,000	\$252,000	\$27,836,000	\$62,588,542	44.2%
606	130th STATN HOSP-HEIDELBERG	\$19,195,000	\$9,857,000	\$3,240,000	\$782,000	\$328,000	\$14,007,000	\$28,980,685	51.9%
607	2nd GENERAL HOSP-LANDSTUHL	\$38,649,000	\$14,321,000	\$7,051,000	\$970,000	\$280,000	\$22,502,000	\$67,449,077	39.2%
608	96th GENERAL HOSP-NURNBERG	\$26,564,000	\$11,048,000	\$4,377,000	\$2,290,000	\$804,000	\$18,519,000	\$43,835,045	42.2%
609	67th EVACUATION HOSP-WURZBURG	\$13,504,000	\$7,134,000	\$2,989,000	\$251,000	\$725,000	\$11,079,000	\$14,969,548	74.0%
611	45th FIELD HOSP-VICENZA	\$7,328,000	\$2,248,000	\$888,000	\$347,000	\$52,000	\$3,615,000	\$13,236,298	27.3%
612	121st EVACUATION HOSP-SEUIL	\$28,848,000	\$3,701,000	\$6,196,000	\$951,000	\$1,300,000	\$12,148,000	\$40,169,615	30.2%
613	GORGAS ACH	\$5,160,100	\$18,724,200	\$3,718,900		\$185,400	\$22,945,400	\$29,696,790	77.3%
614	100th STATION HOSPITAL SHAPE								
	ARMY OVERSEAS HOSPITALS	\$210,123,100	\$102,428,200	\$42,142,900	\$9,256,900	\$4,846,400	\$158,474,400	\$352,797,205	44.9%
615	NH QUANTANAMO BAY	\$4,526,374	\$287,836	\$762,122	\$78,982	\$81,422	\$1,211,342	\$7,028,061	17.2%
616	NH ROOSEVELT ROADS-CEIBA	\$10,186,489	\$1,080,815	\$1,287,805	\$216,257	\$186,284	\$2,770,741	\$13,754,096	20.1%
617	NH NAPLES	\$10,953,783	\$1,064,272	\$1,515,468	\$381,836	\$592,463	\$3,534,039	\$15,915,843	22.2%
618	NH ROTA	\$4,905,983	\$177,823	\$667,741	\$385,728	\$278,637	\$1,799,927	\$9,502,373	21.2%
619	NH SUBIC BAY	\$10,259,495	\$680,822	\$2,582,552	\$203,619	\$389,730	\$3,816,723	\$14,450,179	26.4%
620	NH GUAM-AGANA	\$11,128,857	\$1,421,705	\$2,347,352	\$200,349	\$284,248	\$4,233,652	\$18,529,787	22.8%
621	NH OKINAWA	\$18,237,728	\$1,802,293	\$3,878,388	\$3,288,873	\$536,628	\$9,484,180	\$32,982,106	28.8%
622	NH YOKOSUKA	\$14,580,953	\$874,390	\$3,030,220	\$2,512,944	\$410,099	\$8,827,653	\$23,682,802	28.8%
623	NH KEFLAVIK								
	NAVY OVERSEAS HOSPITALS	\$84,159,822	\$7,369,756	\$16,339,448	\$7,228,566	\$2,738,487	\$33,678,257	\$134,845,247	25.0%
626	USAF HOSP BITBURG	\$7,111,254	\$746,874	\$887,874	\$285,797	\$338,466	\$2,359,011	\$7,226,244	32.6%
627	USAF HOSP HAHN	\$6,590,222	\$809,283	\$881,096	\$305,797	\$274,942	\$2,071,118	\$7,276,946	28.5%
628	USAF RGN MED CTR WIESBADEN	\$0	\$407,257	\$348,349	\$47,279	\$119,481	\$920,376	\$29,445,468	3.1%
629	USAF HOSP LAJES	\$3,369,807	\$347,784	\$309,243	\$81,823	\$179,283	\$918,133	\$4,142,432	22.2%
630	USAF HOSP TORREJON	\$5,519,982	\$1,511,427	\$1,168,354	\$342,098	\$476,731	\$3,498,608	\$9,246,035	37.8%
631	USAF HOSP HELLENKON	\$3,246,419	\$301,208	\$333,811	\$339,900	\$155,111	\$1,130,030	\$3,428,586	33.0%
632	USAF HOSP UPPER HEYFORD	\$6,164,194	\$196,852	\$1,245,530	\$475,312	\$196,361	\$2,114,063	\$11,263,158	18.8%
633	USAF RGN HOSP LAKENHEATH	\$7,879,855	\$724,053	\$2,280,127	\$418,078	\$654,148	\$4,056,407	\$12,663,654	32.0%
634	USAF HOSP IRAKLION	\$1,585,074	\$55,945	\$183,513	\$43,076	\$226,887	\$509,421	\$2,270,734	22.4%
635	USAF HOSP INCIRLIK	\$803,961	\$285,437	\$548,519	\$212,427	\$410,379	\$1,456,762	\$7,535,001	19.3%
636	13th MED CENTER-CLARK AB	\$23,547,729	\$1,173,123	\$5,979,150	\$538,576	\$1,342,140	\$9,032,989	\$31,425,378	28.7%
637	8th MED GRP-KUNSON AB	\$3,822,314	\$103,093	\$347,883	\$18,428	\$187,504	\$656,908	\$4,361,632	15.1%
638	51st MED GRP-OSAN AB	\$6,592,127	\$428,230	\$1,130,803	\$82,235	\$634,020	\$2,275,298	\$7,914,332	28.7%
639	432nd MED GRP-MISAWA	\$6,428,997	\$399,164	\$938,277	\$175,680	\$560,755	\$1,973,876	\$8,759,249	22.5%
640	475th MED GRP-YOKOTA AB	\$4,593,769	\$1,223,851	\$1,399,826	\$345,134	\$586,576	\$3,555,387	\$11,546,992	30.8%
	USAF OVERSEAS HOSPITALS	\$87,055,604	\$8,513,581	\$17,980,355	\$3,711,639	\$6,342,802	\$36,528,377	\$158,505,841	23.0%

NOTE: Expenses and workload within the PRIMUS/NAVCARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

EXHIBIT 6-9: FY88 CLINIC O&M (0807711 & 0807792) MULTIPLIER DERIVATION

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSE	FY88 O&M MULTIPLIER
330	WILCOX AH/C-FT DRUM	\$2,266,800	\$2,547,600	\$1,003,600	\$1,339,600	\$165,400	\$5,056,200	\$7,538,177	67.1%
610	USAHC SAGAMI-JAPAN	\$2,019,000	\$1,208,000	\$313,000	\$138,000	\$51,000	\$1,710,000	\$3,479,701	49.1%
	ARMY CLINICS	\$4,285,800	\$3,755,600	\$1,316,600	\$1,477,600	\$216,400	\$6,766,200	\$11,017,878	61.4%
26	NMCL PORT HUENEME	\$2,049,468	\$583,816	\$1,039,502	\$374,901	\$84,447	\$2,082,666	\$3,956,813	52.6%
41	NMCL KEY WEST	\$1,999,836	\$160,084	\$378,143	\$94,320	\$7,034	\$639,581	\$3,955,079	16.2%
280	NMCL PEARL HARBOR	\$10,127,993	\$1,237,898	\$1,694,598	\$160,769	\$129,264	\$3,222,530	\$10,935,579	29.5%
297	NMCL NEW ORLEANS	\$2,746,110	\$352,554	\$645,940	\$291,365	\$13,954	\$1,303,813	\$4,957,219	26.3%
306	NMCL ANNAPOLIS	\$4,185,041	\$242,489	\$1,140,968	\$155,726	\$356,223	\$1,895,406	\$5,663,227	33.5%
321	NMCL PORTSMOUTH	\$2,665,774	\$180,913	\$1,003,810	\$119,541	\$120,555	\$1,424,819	\$4,701,715	30.3%
385	NMCL QUANTICO	\$4,466,707	\$258,155	\$1,262,754	\$242,100	\$185,129	\$1,948,138	\$11,110,896	17.5%
396	NMCL SEATTLE	\$1,983,235	\$233,242	\$705,453	\$289,433	\$19,914	\$1,248,042	\$3,309,332	37.7%
526	NMCL SAN FRANCISCO	---	---	---	---	---	---	---	---
701	NMCL SAN DIEGO	\$12,783,130	\$1,087,775	\$2,583,029	\$169,603	\$223,618	\$4,064,025	\$19,770,211	20.6%
702	NMCL NORFOLK	\$13,200,513	\$2,951,643	\$7,253,282	\$382,683	\$1,338,305	\$11,925,913	\$20,258,294	58.9%
703	NMCL WASHINGTON DC	\$4,413,012	\$167,186	\$553,970	\$57,767	\$124,864	\$903,787	\$5,470,050	16.5%
8931	NMCL LONDON	---	\$28,244	---	---	---	\$28,244	\$2,894,238	1.0%
	NAVY CLINICS	\$60,620,819	\$7,483,999	\$18,261,450	\$2,338,208	\$2,603,307	\$30,586,964	\$96,982,653	31.6%
203	USAF CLINIC EIELSON	\$2,522,692	\$71,150	\$327,908	\$55,269	\$73,398	\$527,725	\$3,659,432	14.4%
248	USAF CLINIC LOS ANGELES	\$1,817,999	\$299,741	\$142,374	\$77,038	\$63,321	\$582,474	\$1,947,436	29.9%
249	USAF CLINIC NORTON	\$4,359,461	\$597,561	\$1,518,267	\$142,716	\$242,497	\$2,501,041	\$6,522,551	38.3%
250	USAF CLINIC MCCLELLAN	\$3,552,156	\$1,185,648	\$1,043,322	\$262,376	\$776,084	\$3,267,430	\$5,233,767	62.4%
251	USAF CLINIC LOWRY	\$2,550,167	\$478,530	\$189,893	\$32,156	\$141,477	\$842,056	\$2,748,439	30.6%
252	USAF CLINIC PETERSON	\$4,998,639	\$718,149	\$1,545,956	\$1,312,036	\$164,763	\$3,740,904	\$1,764,517	212.0%
287	15th MED GRP-HICKAM	\$5,272,701	\$813,055	\$850,517	\$152,039	\$356,507	\$2,172,118	\$5,982,590	36.3%
293	305th STRAT HOSP-GRISSOM	\$3,486,936	\$392,581	\$663,301	\$255,472	\$132,735	\$1,444,089	\$4,307,680	33.5%
310	USAF CLINIC HANSCOM	\$2,946,252	\$139,033	\$769,878	\$100,294	\$91,206	\$1,100,411	\$3,745,300	29.4%
326	USAF CLINIC MCGUIRE	\$2,632,489	\$201,913	\$305,458	\$27,250	\$272,117	\$806,738	\$2,898,105	27.8%
335	USAF CLINIC POPE	\$3,011,976	\$129,359	\$486,463	\$21,350	\$65,181	\$702,353	\$3,495,844	20.1%
338	USAF CLINIC VANCE	\$1,706,100	\$138,697	\$287,392	\$80,456	\$76,710	\$583,255	\$2,340,065	24.9%
356	USAF CLINIC CHARLESTON	\$3,528,482	\$305,420	\$2,000,864	\$155,465	\$69,155	\$2,530,904	\$3,986,482	63.5%
363	USAF CLINIC BROOKS	\$1,781,062	\$195,027	\$316,602	\$5,988	\$40,544	\$558,161	\$1,951,541	28.6%

-- Continued --

EXHIBIT 6-9: FY88 CLINIC O&M (0807711 & 0807792) MULTIPLIER DERIVATION (Concluded)

DMIS ID	FACILITY	FY88 MILITARY PERSONNEL EXPENSES	FY88 CIVILIAN PERSONNEL EXPENSES	FY88 SUPPLY EXPENSES	FY88 CONTRACT EXPENSES	FY88 OTHER EXPENSES	FY88 OPERATION & MAINTENANCE EXPENSES	FY88 OBSERVED INPATIENT & AMBULATORY SUBTOTAL EXPENSE	FY88 O&M MULTIPLIER
364	USAF CLINIC GOODFELLOW	\$2,265,788	\$446,030	\$776,843	\$153,868	\$148,537	\$1,525,278	\$3,175,399	48.0%
365	USAF CLINIC KELLY	\$2,624,516	\$696,801	\$653,917	\$52,484	\$78,989	\$1,482,191	\$3,391,103	43.7%
366	USAF CLINIC RANDOLPH	\$4,256,770	\$861,921	\$1,161,658	\$53,105	\$266,106	\$2,342,790	\$5,594,061	41.9%
368	USAF CLINIC MCCORD	\$1,795,297	\$347,778	\$266,589	\$75,839	\$88,416	\$778,622	\$4,263,174	18.3%
449	24th MED GRP-HOWARD	---	---	---	---	---	---	---	---
799	USAF CLINIC GELENKIRCHEN	---	---	---	---	---	---	---	---
800	USAF CLINIC RHEIN MAIN	\$244,256	\$297,652	\$317,525	\$33,297	\$112,578	\$761,052	\$3,263,182	23.3%
801	USAF CLINIC SEMBACH	\$1,355,007	\$399,948	\$406,265	\$23,385	\$80,785	\$910,383	\$2,835,534	32.1%
802	43rd STRAT CLINIC-ANDERSON	\$3,396,965	\$259,188	\$374,504	\$114,610	\$164,926	\$913,222	\$3,734,026	24.5%
804	313th MED GRP-KADENA AB	\$3,568,848	\$353,650	\$900,830	\$91,892	\$287,580	\$1,633,952	\$5,255,746	31.1%
805	USAF CLINIC SPANGDAHLEM	\$2,458,736	\$154,167	\$266,642	\$40,478	\$109,131	\$570,418	\$1,797,149	31.7%
806	USAF CLINIC RAMSTEIN	\$6,469,978	\$1,172,418	\$1,084,619	\$140,749	\$432,834	\$2,830,620	\$4,988,472	56.7%
807	USAF CLINIC ZWEIBRUCKEN	\$2,957,261	\$327,193	\$345,470	\$58,736	\$70,819	\$802,218	\$3,132,178	25.6%
808	USAF CLINIC AVIANO	\$1,724,880	\$186,225	\$228,140	\$102,888	\$150,177	\$668,430	\$2,398,607	27.9%
809	USAF CLINIC SAN VITO	\$1,514,010	\$234,163	\$194,516	\$52,984	\$467,763	\$949,426	\$1,602,180	59.3%
811	USAF CLINIC ZARAGOZA	\$0	\$130,222	\$152,288	\$80,822	\$152,238	\$515,570	\$1,205,901	42.8%
812	USAF CLINIC BENTWATERS	\$3,034,638	\$100,438	\$439,693	\$91,308	\$67,224	\$698,663	\$3,661,853	19.1%
813	USAF CLINIC CHICKSANDS	\$1,493,106	\$66,154	\$174,586	\$30,477	\$57,993	\$329,210	\$1,556,311	21.2%
814	USAF CLINIC ALCONBURY-RAF UP	\$3,205,837	\$95,762	\$432,775	\$107,823	\$127,532	\$763,892	\$2,997,371	25.5%
815	USAF CLINIC FAIRFORD	\$0	\$47,871	\$210,127	\$36,202	\$160,413	\$454,613	\$1,493,377	30.4%
824	USAF CLINIC ANKARA	\$0	\$35,005	\$205,392	\$292,940	\$203,135	\$736,472	\$1,425,168	51.7%
825	USAF CLINIC IZMIR	\$0	\$46,902	\$163,711	\$97,929	\$204,071	\$512,613	\$1,932,912	26.5%
827	USAF CLINIC CAMP NEW AMSTERD	\$164,056	\$83,002	\$142,488	\$23,153	\$123,574	\$372,217	\$1,394,638	26.7%
1160	USAF CLINIC COMISO	\$2,539,446	\$123,716	\$175,395	\$32,448	\$192,788	\$524,347	\$1,053,320	49.8%
1161	USAF CLINIC FLORENNES	\$488,168	\$40,229	\$94,629	\$82,159	\$91,771	\$308,788	\$1,419,695	21.8%
1947	USAF CLINIC GREENHAM COMMON	\$1,610,306	\$24,300	\$232,805	\$31,040	\$110,984	\$399,129	\$1,952,020	20.4%
	USAF CLINICS	\$91,334,981	\$12,196,599	\$19,850,602	\$4,580,521	\$6,516,053	\$43,143,775	\$116,107,126	37.2%

Note: Expenses and workload within the PRIMUS/NAV/CARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

(Peterson). Due to data incompleteness, certain computed values are suspect. These data completeness issues will be resolved through contact with Service financial and MEPRS data representatives.

The variation observed in these estimates underscores the importance of applying O&M estimators at the MTF level. Use of Service branch averages would produce O&M dollar estimates for some MTFs which would deviate significantly from historical amounts. Although it may be desirable to allow MTF O&M allocations to vary from historical amounts, the variation must be based upon additional information such as military/civilian end strengths, expected staffing against authorizations, substitution of contracting for staffing shortfalls, etc.

This observation highlights the need for additional investigation to better understand the relationships of O&M expenses to total MEPRS expenses, both within a given year and between years. Further, the extent to which these estimates vary for each MTF, and the underlying factors influencing O&M expenses, will provide valuable input to the process of refining the O&M estimation process. A review of alternative O&M estimation procedures is presented in section 6.3 of this document.

6.2 APPLICATION OF THE O&M MULTIPLIER

The multiplier described in the previous section provides a means of estimating O&M expenses based upon predicted MEPRS inpatient and ambulatory expense. The resultant estimates rely upon the fact that O&M expenses, although not identical, are highly correlated with total MEPRS inpatient and ambulatory expenses. This correlation provides the basis for a ratio estimator (the O&M multiplier) that can be used to predict Service O&M expense given predicted MEPRS expenses as an input. The MTF-specific O&M multipliers presented in the previous section were applied to modeled FY88 inpatient and ambulatory MEPRS expenses to compute

estimates of O&M expenses for each MTF. The resultant estimates were compared to observed 0807711 and 0807792 O&M expenses from the Service financial data sets at the MTF and Service levels.

Exhibits 6-10 through 6-13 provide detailed O&M estimates by MTF for medical centers, CONUS community hospitals, overseas hospitals, and clinics, respectively. In each exhibit, the modeled inpatient clinician, inpatient nonclinician, and ambulatory expenses (as presented in chapter 5) have been adjusted using each respective MTF's O&M multiplier. Total inpatient and ambulatory O&M is computed by summing these three individual components of expense. Each exhibit also presents modeled and observed inpatient and ambulatory expense per MWU.¹ Finally, the ratio of modeled to observed O&M expense per MWU is also presented.

A review of the ratio of modeled to observed expenses illustrates several important points relative to implementation of this methodology. The overall ratio of modeled to observed for each Service branch is presented below:

¹Observed inpatient nonclinician, inpatient clinician, and ambulatory O&M expenses is computed based upon the product of observed FY88 MEPRS inpatient nonclinician, inpatient clinician, and ambulatory expenses and the respective MTF O&M multiplier.

EXHIBIT 6-10: DERIVATION OF FY88 MEDICAL CENTER INPATIENT AND AMBULATORY O&M MODELED EXPENSES

OWIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSE/IWU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSE/IWU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSE/AWU	MODELED INPATIENT & AMBULATORY O & M EXPENSES	MODELED INPATIENT & AMBULATORY O&M EXPENSES/MWU	OBSERVED 0807711 & 0807792 O&M EXPENSES/MWU	RATIO OF MODELED TO OBSERVED
22	LETTERMAN AMC-PRESIDIO OF SF	\$21,852,776	\$1,083	\$1,315,280	\$66	\$11,904,328	\$963	\$35,182,384	\$1,096	\$1,121	0.98
31	FITZSIMONS AMC-DENVER	\$23,004,977	\$899	\$1,506,314	\$59	\$14,773,315	\$947	\$39,284,606	\$913	\$1,015	0.90
37	WALTER REED AMC-WASHINGTON	\$50,428,841	\$1,150	\$3,243,066	\$74	\$28,541,937	\$1,018	\$82,213,844	\$1,144	\$1,220	0.94
47	EISENHOWER AMC-FT GORDON	\$19,808,083	\$973	\$1,324,940	\$65	\$14,959,526	\$942	\$36,192,526	\$996	\$1,008	0.99
52	TRIPLER AMC-FT SHAFTER	\$25,342,122	\$977	\$1,680,104	\$58	\$17,984,738	\$917	\$45,007,053	\$884	\$988	0.90
108	WILLIAM BEAUMONT AMC-FT BLISS	\$24,565,715	\$998	\$1,648,330	\$66	\$18,473,651	\$938	\$44,875,686	\$1,002	\$829	1.08
125	MADIGAN AMC-FT LEWIS	\$26,003,723	\$1,148	\$1,825,455	\$72	\$25,680,431	\$1,003	\$56,509,609	\$1,111	\$954	1.16
	ARMY MEDICAL CENTERS	\$184,098,216	\$1,027	\$12,541,579	\$66	\$132,407,828	\$941	\$339,045,722	\$1,028	\$1,044	0.98
77	NH OAKLAND	\$12,037,027	\$843	\$669,755	\$47	\$8,216,252	\$1,019	\$20,923,034	\$936	\$967	0.97
29	NH SAN DIEGO	\$28,140,153	\$952	\$1,450,141	\$53	\$14,680,562	\$1,043	\$42,270,856	\$1,018	\$1,203	0.85
87	NH BETHESDA	\$18,253,862	\$809	\$1,089,575	\$47	\$12,991,262	\$938	\$32,314,748	\$988	\$1,051	0.84
124	NH PORTSMOUTH	\$19,563,337	\$875	\$1,191,894	\$41	\$10,839,692	\$818	\$31,694,923	\$748	\$782	0.96
	NAVY MEDICAL CENTERS	\$75,894,399	\$915	\$4,381,364	\$47	\$46,827,798	\$949	\$127,203,591	\$992	\$1,002	0.99
14	DAVID GRANT MED CTR-TRAVIS	\$12,527,981	\$900	\$626,418	\$53	\$9,381,540	\$963	\$22,735,849	\$857	\$761	1.13
55	USAF MED CTR SCOTT	\$6,800,096	\$752	\$473,485	\$52	\$7,828,650	\$990	\$15,100,231	\$846	\$847	1.00
66	MALCOM GROW MED CTR-ANDREWS	\$8,956,862	\$678	\$662,302	\$50	\$9,724,183	\$904	\$19,343,377	\$763	\$725	1.05
73	USAF MED CTR KEESLER	\$11,949,266	\$695	\$924,081	\$49	\$8,542,309	\$783	\$21,315,637	\$759	\$764	0.99
95	USAF MED CTR WRIGHT-PATTERSON	\$11,551,757	\$1,043	\$721,283	\$65	\$12,008,578	\$1,057	\$24,281,617	\$1,082	\$1,147	0.94
109	BROOKE AMC (JMMC)-FT SAM HOUSTON	\$30,989,512	\$941	\$2,083,968	\$64	\$23,425,460	\$942	\$56,508,939	\$977	\$961	1.02
117	WILFORD HALL MED CTR-LACKLAND	\$28,287,821	\$662	\$1,979,634	\$46	\$17,481,828	\$685	\$47,748,881	\$700	\$837	0.84
	USAF MEDICAL CENTERS	\$111,083,035	\$783	\$7,581,151	\$53	\$68,380,346	\$946	\$207,034,532	\$940	\$967	0.97

NOTE: Expenses and workload within the PRIMUS/NAVCARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

EXHIBIT 6-11: DERIVATION OF FY88 CONUS COMMUNITY HOSPITAL INPATIENT & AMBULATORY O & M MODELED EXPENSES

DMIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSE/INWU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSE/INWU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSE/AMWU	MODELED INPATIENT & AMBULATORY O&M EXPENSES	MODELED INPATIENT & AMBULATORY O&M EXPENSES/INWU	OBSERVED 0807711 & 0807712 O&M EXPENSES/AMWU	RATIO OF MODELED TO OBSERVED
1	FOX AH-REDSTONE ARSENAL	\$2,351,648	\$1,245	\$115,101	\$61	\$3,921,070	\$1,164	\$6,367,819	\$1,215	\$1,207	1.01
2	NOBLE AH-FT MCLELLAN	\$4,205,845	\$1,045	\$225,791	\$56	\$5,080,177	\$1,028	\$9,511,812	\$1,061	\$934	1.14
3	LYSTER AH-FT RUCKER	\$2,854,844	\$988	\$150,023	\$47	\$4,750,751	\$945	\$7,755,618	\$878	\$991	0.89
5	BASSETT AH-FT WAINWRIGHT	\$1,328,104	\$581	\$68,943	\$29	\$2,684,415	\$536	\$4,079,552	\$559	\$756	0.74
8	BLISS AH-FT HUACHUCA	\$2,888,493	\$988	\$151,987	\$47	\$4,230,378	\$955	\$7,270,858	\$987	\$948	0.93
23	HAYS AH-FT ORD	\$6,834,284	\$786	\$384,599	\$44	\$9,321,022	\$766	\$16,539,904	\$793	\$898	0.89
32	EVANS AH-FT CARSON	\$6,608,824	\$913	\$368,828	\$51	\$9,932,533	\$985	\$16,910,185	\$916	\$966	0.95
48	MARTIN AH-FT BENNING	\$10,587,129	\$943	\$403,507	\$48	\$14,204,711	\$922	\$25,485,347	\$851	\$785	1.08
49	WINN AH-FT STEWART	\$3,785,746	\$715	\$207,498	\$38	\$6,041,811	\$689	\$10,034,855	\$714	\$837	0.85
57	IRWIN AH-FT RILEY	\$4,786,436	\$768	\$265,225	\$42	\$7,512,520	\$740	\$12,567,182	\$766	\$772	0.99
58	MUNSON AH-FT LEAVENWORTH	\$2,179,987	\$948	\$109,970	\$48	\$4,347,180	\$875	\$6,837,148	\$913	\$945	0.97
60	BLANCHFIELD AH-FT CAMPBELL	\$8,217,912	\$799	\$465,466	\$45	\$11,377,256	\$778	\$20,080,633	\$805	\$728	1.11
81	IRELAND AH-FT KNOX	\$8,195,466	\$879	\$462,499	\$50	\$11,914,754	\$855	\$20,572,718	\$789	\$769	1.15
84	BAYNE JONES AH-FT POLK	\$4,613,680	\$820	\$253,889	\$45	\$6,292,843	\$798	\$11,160,412	\$826	\$808	0.91
88	KIMBROUGH AH-FT MEADE	\$3,573,088	\$985	\$190,048	\$52	\$11,388,311	\$905	\$15,152,426	\$935	\$943	0.99
70	CUTLER AH-FT DEVENS	\$2,422,268	\$1,028	\$122,631	\$52	\$4,611,236	\$954	\$7,156,134	\$995	\$999	1.00
75	WOOD AH-FT LEONARD WOOD	\$7,814,793	\$911	\$436,534	\$51	\$9,622,682	\$891	\$17,877,020	\$923	\$966	0.83
81	ITTERSON AH-FT MONMOUTH	\$1,807,271	\$1,090	\$75,573	\$50	\$3,798,903	\$931	\$5,481,747	\$979	\$1,266	0.77
82	SON AH-FT DIX	\$4,783,203	\$778	\$263,205	\$43	\$7,548,790	\$816	\$12,607,198	\$778	\$861	0.90
86	KELLER AH-FT WEST POINT	\$3,311,251	\$820	\$177,814	\$44	\$3,587,247	\$816	\$7,078,312	\$839	\$798	1.05
89	WOMACK AH-FT BRAGG	\$12,583,012	\$830	\$721,477	\$48	\$18,555,642	\$808	\$31,870,131	\$836	\$846	1.29
98	REYNOLDS AH-FT SILL	\$6,633,802	\$900	\$372,548	\$45	\$8,980,373	\$780	\$15,996,523	\$780	\$753	1.07
105	MONCRIEF AH-FT JACKSON	\$7,083,350	\$875	\$396,229	\$49	\$9,801,589	\$856	\$16,261,168	\$886	\$859	1.03
110	DARNALL AH-FT HOOO	\$10,631,149	\$931	\$406,354	\$47	\$14,559,381	\$910	\$25,796,884	\$938	\$818	1.02
121	MCDONALD AH-FT EUSTIS	\$3,245,324	\$968	\$170,758	\$52	\$7,057,531	\$931	\$10,473,623	\$966	\$851	1.14
122	KENNER AH-FT LEE	\$3,736,806	\$968	\$200,066	\$52	\$5,583,363	\$933	\$9,523,235	\$967	\$887	1.09
123	DEWITT AH-FT BELVOIR	\$5,649,377	\$854	\$313,827	\$47	\$8,636,802	\$826	\$14,600,005	\$855	\$817	1.05
131	WEED AH-FT IRWIN	\$580,475	\$486	\$24,803	\$21	\$981,455	\$437	\$1,568,734	\$461	\$607	0.76
204	HAWLEY AH-FT B. HARRISON	\$932,705	\$1,288	\$36,009	\$50	\$2,744,090	\$974	\$3,712,804	\$1,049	\$1,042	1.01
	ARMY CONUS COMMUNITY HOSPITALS	\$144,012,183	\$855	\$7,944,201	\$47	\$218,189,822	\$828	\$370,125,987	\$857	\$842	1.02
7	BRH NAVSTA ADAK	\$231,235	\$528	\$8,755	\$20	\$368,011	\$487	\$608,001	\$510	\$438	1.16
24	NH CAMP PENDLETON	\$5,783,797	\$719	\$389,664	\$48	\$6,782,543	\$747	\$12,826,004	\$757	\$764	0.99
25	NH LONG BEACH	\$3,243,361	\$692	\$211,735	\$45	\$4,510,710	\$711	\$7,965,806	\$722	\$1,044	0.69
28	NH LEMOORE	\$857,979	\$667	\$46,793	\$36	\$1,707,050	\$624	\$2,691,922	\$649	\$526	1.23
30	BRH MAGGCC TWENTY NINE PALMS	\$1,025,783	\$739	\$56,893	\$41	\$1,704,346	\$726	\$2,787,022	\$746	\$458	1.63
35	NH GROTON	\$1,340,481	\$645	\$80,018	\$39	\$2,770,576	\$626	\$4,191,074	\$645	\$840	0.77
38	NH PENSACOLA	\$4,229,805	\$800	\$278,465	\$53	\$8,008,032	\$808	\$12,516,302	\$824	\$880	0.94
39	NH JACKSONVILLE	\$5,567,730	\$661	\$375,877	\$45	\$8,550,886	\$677	\$14,494,493	\$689	\$705	0.98
40	NH ORLANDO	\$3,838,350	\$803	\$250,925	\$53	\$7,261,875	\$809	\$11,351,150	\$825	\$789	1.05
56	NH GREAT LAKES	\$4,651,686	\$714	\$310,150	\$48	\$7,120,853	\$732	\$15,434,688	\$732	\$675	1.08
68	NH PATUXENT RIVER	\$910,989	\$1,340	\$41,332	\$61	\$2,102,087	\$1,124	\$3,072,408	\$1,197	\$858	1.40
91	NH CAMP LEJEUNE	\$5,491,746	\$791	\$367,390	\$53	\$6,448,572	\$822	\$12,307,707	\$832	\$750	1.11
92	NH CHERRY POINT	\$1,643,634	\$883	\$96,403	\$52	\$3,401,374	\$851	\$5,141,411	\$877	\$634	1.38
99	NH PHILADELPHIA	\$1,884,906	\$853	\$113,559	\$51	\$3,611,423	\$838	\$5,609,888	\$861	\$1,049	0.82
100	NH NEWPORT	\$1,662,445	\$738	\$100,449	\$45	\$2,333,140	\$757	\$4,096,033	\$767	\$1,042	0.74
103	NH CHARLESTON	\$6,802,646	\$785	\$459,801	\$53	\$6,884,332	\$821	\$14,146,781	\$829	\$719	1.15
104	NH BEAUFORT	\$1,680,710	\$693	\$102,601	\$42	\$4,337,387	\$665	\$6,120,697	\$684	\$591	1.16

Continued

EXHIBIT 6-11: DERIVATION OF FY88 CONUS COMMUNITY HOSPITAL INPATIENT & AMBULATORY O & M MODELED EXPENSES
(Continued)

DMIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSE/IMU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSE/IMU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSE/AMU	MODELED INPATIENT & AMBULATORY O&M EXPENSES	MODELED INPATIENT & AMBULATORY O&M EXPENSES/IMU	OBSERVED 0807/11 & 0807/92 O&M EXPENSES/IMU	RATIO OF MODELED TO OBSERVED
107	NH MILLINGTON	\$1,749,783	\$629	\$108,692	\$39	\$3,132,544	\$627	\$4,991,020	\$642	\$718	0.89
118	NH CORPUS CHRISTI	\$1,068,334	\$824	\$61,756	\$36	\$2,072,676	\$603	\$3,202,766	\$622	\$747	0.83
126	NH BREMERTON	\$4,361,513	\$947	\$284,349	\$82	\$5,485,639	\$982	\$10,131,501	\$984	\$861	1.03
127	NH OAK HARBOR	\$1,501,315	\$1,156	\$82,009	\$63	\$2,648,900	\$1,121	\$4,232,224	\$1,157	\$844	1.37
	NAVY CONUS COMMUNITY HOSPITALS	\$59,528,228	\$780	\$3,827,615	\$48	\$84,872,858	\$782	\$158,028,799	\$780	\$775	1.01
4	AIR UNIVERSITY RGN HOSP MAXWELL	\$2,802,703	\$798	\$124,104	\$39	\$4,650,441	\$821	\$7,377,247	\$826	\$848	0.97
6	USAF HOSP ELMENDORF	\$3,275,638	\$585	\$183,216	\$29	\$3,770,183	\$628	\$7,209,015	\$621	\$727	0.85
9	82nd MED GRP LUKE	\$2,522,242	\$747	\$120,659	\$36	\$4,607,405	\$770	\$7,250,306	\$734	\$734	1.08
10	836th M-C GRP DAVIS MONTHAN	\$2,222,432	\$756	\$104,755	\$36	\$4,347,736	\$771	\$6,674,923	\$778	\$889	0.88
11	USAF HOSP WILLIAMS	\$725,974	\$687	\$28,450	\$27	\$1,798,358	\$630	\$2,550,781	\$653	\$878	0.75
12	97th STRAT HOSP EAKER	\$888,864	\$785	\$35,487	\$31	\$1,684,793	\$764	\$2,609,124	\$781	\$772	1.01
13	USAF HOSP LITTLE ROCK	\$1,023,362	\$731	\$42,870	\$31	\$2,511,468	\$693	\$3,577,699	\$713	\$712	1.00
15	9th STRAT HOSP BEALE	\$989,890	\$688	\$41,609	\$29	\$1,768,136	\$689	\$2,799,528	\$696	\$777	0.90
16	USAF HOSP MATHER	\$2,210,848	\$614	\$106,437	\$30	\$3,216,883	\$648	\$5,534,168	\$645	\$707	0.91
17	93rd STRAT HOSP CASTLE	\$1,122,005	\$677	\$48,614	\$29	\$2,587,822	\$657	\$3,758,441	\$672	\$567	1.18
18	1st STRAT HOSP VANDENBERG	\$1,827,979	\$882	\$71,754	\$39	\$2,959,878	\$801	\$4,659,610	\$812	\$899	1.01
19	USAF HOSP EDWARDS	\$843,153	\$747	\$33,606	\$30	\$1,862,964	\$702	\$2,769,724	\$724	\$746	0.97
20	831st MED GRP GEORGE	\$980,868	\$521	\$43,445	\$23	\$1,740,800	\$529	\$2,764,713	\$535	\$477	1.12
21	22nd STRAT HOSP MARCH	\$3,044,401	\$674	\$149,438	\$33	\$4,202,889	\$713	\$7,398,729	\$711	\$784	0.91
23	USAF ACADEMY HOSP	\$2,774,415	\$604	\$136,354	\$30	\$4,499,500	\$632	\$7,410,270	\$633	\$675	0.94
36	USAF HOSP DOVER	\$1,413,225	\$883	\$80,831	\$38	\$2,894,361	\$889	\$4,388,417	\$886	\$774	1.14
42	USAF RGN HOSP EGLIN	\$5,583,980	\$656	\$284,370	\$33	\$7,056,583	\$697	\$12,924,932	\$694	\$701	0.90
43	325th MED GRP TYNDALL	\$1,525,355	\$840	\$65,828	\$41	\$3,211,350	\$822	\$4,802,532	\$841	\$1,228	0.77
44	31st MED GRP HOMESTEAD	\$2,211,614	\$886	\$105,307	\$33	\$3,877,935	\$708	\$6,184,856	\$712	\$712	1.00
45	58th MED GRP MACDILL	\$4,044,199	\$884	\$197,007	\$48	\$7,114,759	\$1,021	\$11,355,965	\$1,025	\$1,002	1.02
46	USAF HOSP PATRICK	\$1,277,211	\$1,319	\$48,882	\$50	\$3,846,769	\$1,155	\$5,172,862	\$1,203	\$1,428	0.84
50	347th MED GRP MOODY	\$935,486	\$885	\$38,864	\$29	\$1,817,334	\$682	\$2,791,683	\$696	\$725	0.96
51	USAF HOSP ROBINS	\$1,108,408	\$744	\$46,938	\$32	\$2,446,586	\$720	\$3,599,932	\$737	\$794	0.93
53	368th MED GRP MOUNTAIN HOME	\$745,053	\$536	\$31,163	\$22	\$1,421,510	\$529	\$2,197,727	\$536	\$488	1.11
54	USAF HOSP CHANUTE	\$1,306,410	\$633	\$66,009	\$36	\$2,921,159	\$609	\$4,283,578	\$627	\$736	1.12
59	384th STRAT HOSP MCCONNELL	\$510,708	\$1,062	\$15,225	\$32	\$1,370,166	\$818	\$1,896,099	\$879	\$1,034	0.85
62	2nd STRAT HOSP BARKSDALE	\$2,734,553	\$810	\$130,827	\$36	\$4,598,744	\$840	\$7,464,124	\$843	\$742	1.14
63	23rd MED GRP ENGLAND	\$663,443	\$796	\$34,077	\$31	\$1,911,896	\$747	\$2,809,415	\$771	\$828	0.93
65	42nd STRAT HOSP LORING	\$1,133,469	\$831	\$47,225	\$35	\$2,605,368	\$877	\$2,786,082	\$872	\$734	1.19
71	379th STRAT HOSP WURTSMITH	\$816,508	\$748	\$32,270	\$30	\$1,615,430	\$719	\$2,464,206	\$736	\$752	0.98
72	410th STRAT HOSP KILSAWYER	\$763,835	\$756	\$29,587	\$29	\$1,602,386	\$711	\$2,395,807	\$734	\$750	0.98
74	USAF HOSP COLUMBUS	\$406,050	\$923	\$11,628	\$26	\$1,141,416	\$683	\$1,559,095	\$739	\$834	0.89
76	351st STRAT HOSP WHITEMAN	\$1,050,495	\$706	\$44,572	\$30	\$1,815,738	\$730	\$2,710,806	\$733	\$664	1.10
77	341st STRAT HOSP MALMSTROM	\$543,739	\$1,026	\$16,896	\$32	\$1,892,475	\$762	\$2,453,110	\$814	\$758	1.07
78	EHRING BEQUEST RGN HOSP OF FUITT	\$4,230,241	\$849	\$209,150	\$42	\$7,211,665	\$886	\$11,651,056	\$888	\$774	1.15
79	554th MED GRP NELLIS	\$1,887,451	\$789	\$86,710	\$36	\$3,998,952	\$792	\$5,973,113	\$803	\$757	1.06
80	509th STRAT HOSP PEASE	\$1,685,813	\$753	\$76,728	\$34	\$2,793,580	\$779	\$4,496,121	\$782	\$864	0.91
83	USAF HOSP KIRTLAND	\$2,451,075	\$895	\$114,575	\$42	\$4,088,262	\$926	\$6,653,913	\$930	\$913	1.02
84	833rd MED GRP HOLLOMAN	\$877,833	\$668	\$36,275	\$28	\$2,169,891	\$628	\$3,083,999	\$647	\$601	1.08
85	27th MED GRP CANNON	\$940,925	\$664	\$39,517	\$28	\$1,617,346	\$670	\$2,597,788	\$678	\$690	0.98
87	380th STRAT HOSP PLATTSBURGH	\$797,674	\$919	\$29,574	\$34	\$2,954,574	\$829	\$2,685,361	\$863	\$827	1.04
88	416th STRAT HOSP GRIFFISS	\$1,010,713	\$845	\$40,867	\$34	\$2,312,299	\$797	\$3,363,879	\$821	\$803	1.02

Continued

EXHIBIT 6-11: DERIVATION OF FY88 CONUS COMMUNITY HOSPITAL INPATIENT & AMBULATORY O & M MODELED EXPENSES
(Concluded)

DMIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSE/IWU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSE/IWU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSE/AWU	MODELED INPATIENT & AMBULATORY O&M EXPENSES	MODELED INPATIENT & AMBULATORY O&M EXPENSES/IWU	OBSERVED 0807711 & 0807792 O&M EXPENSES/IWU	RATIO OF MODELED TO OBSERVED
90	41st MED GRP SEYMOUR JOHNSON	\$1,627,398	\$1,337	\$68,075	\$54	\$3,923,328	\$1,252	\$5,616,802	\$1,291	\$1,128	1.14
93	842nd STRAT HOSP-GRAND FORKS	\$1,143,506	\$654	\$50,028	\$29	\$2,191,443	\$654	\$3,384,978	\$663	\$505	1.31
94	857th STRAT HOSP-MINOT	\$2,240,200	\$832	\$104,511	\$39	\$3,036,124	\$894	\$5,380,835	\$760	\$760	1.15
96	USAF HOSP TINKER	\$2,644,220	\$948	\$123,857	\$44	\$5,368,478	\$983	\$8,134,555	\$974	\$778	1.25
97	USAF HOSP ALTUS	\$902,480	\$607	\$35,891	\$32	\$1,702,247	\$786	\$2,640,618	\$804	\$781	1.06
101	363rd MED GRP SHAW	\$1,037,703	\$505	\$46,624	\$23	\$2,008,418	\$509	\$3,062,746	\$515	\$738	0.70
102	354th MED GRP MYRTLE BEACH	\$749,380	\$824	\$28,188	\$31	\$1,901,182	\$735	\$2,878,730	\$767	\$782	1.01
106	44th STRAT HOSP-ELLSWORTH	\$1,348,908	\$483	\$63,212	\$23	\$1,981,689	\$507	\$3,393,817	\$506	\$400	1.27
111	USAF HOSP REESE	\$623,202	\$1,025	\$20,456	\$34	\$1,519,271	\$658	\$2,162,928	\$910	\$888	1.02
112	98th STRAT HOSP-DYESS	\$2,022,901	\$782	\$94,195	\$36	\$3,176,844	\$794	\$5,293,740	\$798	\$646	1.23
113	USAF RGN HOSP SHEPPARD	\$3,043,323	\$804	\$150,580	\$30	\$3,904,947	\$843	\$7,098,860	\$638	\$700	0.91
114	USAF HOSP LAUGHLIN	\$536,702	\$632	\$19,713	\$23	\$1,032,942	\$597	\$1,588,357	\$618	\$539	1.14
115	67th MED GRP BERGSTROM	\$1,335,718	\$987	\$55,809	\$40	\$3,337,797	\$913	\$4,720,324	\$939	\$1,024	0.92
116	R. THOMPSON STRAT HOSP-CARSWELL	\$5,635,215	\$826	\$284,008	\$42	\$7,313,547	\$877	\$13,232,769	\$872	\$980	0.88
119	USAF HOSP HILL	\$2,399,784	\$1,110	\$108,665	\$50	\$4,481,008	\$1,128	\$8,969,455	\$1,138	\$924	1.23
120	1st MED GRP LANGLEY	\$3,405,671	\$754	\$167,180	\$37	\$5,712,881	\$787	\$9,285,722	\$789	\$759	1.04
128	82nd STRAT HOSP-FAIRCHILD	\$2,150,780	\$803	\$100,270	\$37	\$3,482,238	\$833	\$5,743,267	\$836	\$789	1.06
129	90th STRAT HOSP-F.E. WARREN	\$1,045,583	\$551	\$46,363	\$24	\$1,496,421	\$580	\$2,588,378	\$578	\$544	1.06
	USAF CONUS COMMUNITY HOSPITALS	\$103,598,503	\$765	\$4,747,394	\$35	\$183,747,721	\$775	\$282,094,618	\$781	\$777	1.00

NOTE: Expenses and workload within the PRIMUS/NAVCARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

EXHIBIT 6-12: DERIVATION OF FY88 OVERSEAS HOSPITAL INPATIENT & AMBULATORY O & M MODELED EXPENSES

OWIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSE/IMU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSE/IMU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSE/AMU	MODELED INPATIENT & AMBULATORY O&M EXPENSES	MODELED INPATIENT & AMBULATORY O&M EXPENSES/AMU	OBSERVED 0807711 & 0807792 O&M EXPENSES/AMU	RATIO OF MODELED TO OBSERVED
601	34th GENERAL HOSP-AUGSBURG	\$3,236,641	\$942	\$228,073	\$66	\$5,461,565	\$1,040	\$9,924,279	\$1,027	\$1,104	0.93
602	5th GENERAL HOSP-BAD CANNSTATT	\$4,751,204	\$753	\$342,545	\$54	\$6,703,805	\$810	\$11,797,554	\$809	\$785	1.03
603	AH BERLIN										
604	2nd FIELD HOSP-BREMENHAFEN	\$1,732,034	\$638	\$114,266	\$62	\$3,215,924	\$1,097	\$5,082,224	\$1,059	\$1,040	1.02
605	97th GENERAL HOSP-FRANKFURT	\$9,797,447	\$980	\$713,842	\$65	\$18,843,182	\$907	\$27,204,471	\$921	\$932	0.96
606	130th STATN HOSP-HEIDELBERG	\$4,991,230	\$1,066	\$355,097	\$78	\$9,718,885	\$1,126	\$15,083,212	\$1,132	\$1,052	1.08
607	2nd GENERAL HOSP-LANDSTUHL	\$10,240,320	\$778	\$753,394	\$57	\$10,223,883	\$824	\$21,217,597	\$829	\$980	0.94
608	98th GENERAL HOSP-MURNBERG	\$6,013,732	\$952	\$435,336	\$62	\$10,597,446	\$891	\$17,016,514	\$900	\$979	0.92
609	67th EVACUATION HOSP-WURZBURG	\$6,158,273	\$1,532	\$434,451	\$108	\$12,607,651	\$1,824	\$19,200,376	\$1,829	\$940	1.73
610	45th FIELD HOSP-VICENZA	\$740,902	\$650	\$45,478	\$40	\$1,578,058	\$791	\$2,362,434	\$754	\$1,154	0.85
611	121st EVACUATION HOSP-SEOUL	\$4,509,233	\$609	\$326,955	\$44	\$6,983,502	\$643	\$11,699,690	\$648	\$672	0.96
612	GORGAS ACH										
613	198th STATION HOSPITAL SHAPE	\$11,659,240	\$1,556	\$845,729	\$113	\$12,090,289	\$1,714	\$24,595,258	\$1,691	\$1,577	1.07
614											
615	ARMY OVERSEAS HOSPITALS	\$63,770,257	\$943	\$4,593,163	\$68	\$96,870,189	\$1,006	\$164,233,809	\$1,007	\$872	1.04
616	NH GUANTANAMO BAY	\$479,037	\$481	\$26,979	\$27	\$891,149	\$654	\$1,397,185	\$593	\$514	1.15
617	NH ROOSEVELT ROADS CEIBA	\$659,650	\$517	\$52,703	\$32	\$1,386,428	\$650	\$2,298,781	\$605	\$730	0.83
618	NH NAPLES	\$993,049	\$566	\$81,305	\$35	\$1,878,761	\$681	\$2,931,115	\$638	\$769	0.83
619	NH ROTA	\$733,148	\$563	\$43,361	\$33	\$1,368,711	\$704	\$2,143,217	\$661	\$555	1.19
620	NH SUBIC BAY	\$2,248,806	\$630	\$148,175	\$42	\$3,302,800	\$708	\$5,697,781	\$692	\$464	1.49
621	NH GUAM-AGANA	\$1,834,112	\$547	\$120,447	\$36	\$2,408,015	\$637	\$4,362,574	\$612	\$594	1.03
622	NH OKINAWA	\$4,228,818	\$666	\$287,076	\$45	\$3,766,641	\$763	\$8,280,735	\$734	\$841	0.87
623	NH YOKOSUKA	\$2,462,006	\$688	\$182,412	\$45	\$3,756,697	\$766	\$6,381,115	\$752	\$805	0.93
623	NH KEFLAVIK										
624	NAVY OVERSEAS HOSPITALS	\$13,834,824	\$613	\$802,459	\$40	\$18,755,401	\$706	\$33,492,462	\$692	\$686	0.99
626	USAF HOSP BITBURG	\$1,211,454	\$656	\$55,581	\$30	\$1,831,619	\$707	\$3,098,654	\$698	\$532	1.31
627	USAF HOSP HAHN	\$860,813	\$590	\$38,258	\$28	\$1,534,887	\$626	\$2,433,758	\$622	\$530	1.18
628	USAF RGN MED CTR WIESBADEN	\$487,388	\$57	\$24,691	\$3	\$317,912	\$58	\$429,991	\$59	\$65	0.90
629	USAF HOSP LAJES	\$290,013	\$585	\$10,435	\$20	\$337,266	\$744	\$646,714	\$693	\$672	1.03
630	USAF HOSP TORREJON	\$1,530,539	\$751	\$71,014	\$35	\$1,931,908	\$851	\$3,533,460	\$821	\$812	1.01
631	USAF HOSP HELLENKON	\$388,169	\$938	\$12,571	\$90	\$1,172,393	\$910	\$1,573,133	\$924	\$664	1.39
632	USAF HOSP UPPER HEYFORD	\$786,732	\$371	\$26,681	\$17	\$1,092,223	\$401	\$1,915,615	\$396	\$437	0.91
633	USAF RGN HOSP LAKEHEATH	\$2,312,508	\$603	\$113,148	\$30	\$2,742,209	\$615	\$5,167,864	\$623	\$489	1.27
634	USAF HOSP IRAKLION	\$150,472	\$1,185	\$2,625	\$21	\$505,510	\$1,094	\$658,606	\$1,118	\$965	1.29
635	USAF HOSP INCIRLIK	\$500,922	\$413	\$21,824	\$18	\$682,590	\$531	\$1,215,136	\$483	\$579	0.83
636	13th MED CENTER-CLARK AB	\$4,845,137	\$522	\$245,997	\$26	\$3,702,590	\$515	\$8,793,724	\$533	\$548	0.97
637	8th MED GRP-KUNSON AB	\$155,828	\$468	\$4,621	\$14	\$393,812	\$570	\$554,260	\$541	\$642	0.84
638	51st MED GRP-OSAN AB	\$868,294	\$596	\$38,592	\$26	\$1,368,787	\$667	\$2,276,672	\$649	\$648	1.00
639	432nd MED GRP-MISAWA	\$577,901	\$482	\$1,189,662	\$21	\$1,792,456	\$500	\$1,792,456	\$552	\$552	0.91
640	475th MED GRP YOKOTA AB	\$1,063,765	\$625	\$48,311	\$28	\$1,675,080	\$675	\$2,787,155	\$666	\$850	0.78
640	USAF OVERSEAS HOSPITALS	\$16,038,733	\$444	\$749,021	\$21	\$20,789,445	\$538	\$37,577,200	\$502	\$486	1.03

NOTE: Expenses and workload within the PRIMUS/NAVARE and Occupational Health Accounts were excluded prior to development and analysis of the ambulatory expense models in FY88 and FY89.

EXHIBIT 6-13: DERIVATION OF FY88 CLINIC INPATIENT AND AMBULATORY O & M MODELED EXPENSES

DMIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSES/WWU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSES/WWU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSES/WWU	MODELED INPATIENT AND AMBULATORY O&M EXPENSES	MODELED INPATIENT AND AMBULATORY O&M EXPENSES/WWU	OBSERVED 0807711 AND 0807792 O&M EXPENSES/WWU	RATIO OF MODELED TO OBSERVED
330 610	WILCOX AHC-FT DRUM USAHC SAGAMI-JAPAN	---	---	---	---	\$5,377,146 \$1,568,211	\$1,518 \$1,722	\$5,377,146 \$1,568,211	\$1,518 \$1,722	\$1,427 \$1,890	1.06 0.91
	ARMY CLINICS	---	---	---	---	\$8,935,357	\$1,560	\$8,935,357	\$1,560	\$1,522	1.03
26 41	NMCL PORT HUENEME NMCL KEY WEST	---	---	---	---	\$2,605,040 \$648,344	\$1,534 \$806	\$2,605,040 \$648,344	\$1,534 \$806	\$1,227 \$707	1.25 0.86
280 297	NMCL PEARL HARBOR NMCL NEW ORLEANS	---	---	---	---	\$4,161,713 \$1,025,197	\$654 \$882	\$4,161,713 \$1,025,197	\$654 \$882	\$506 \$1,121	1.20 0.79
308 321	NMCL ANAPOULIS NMCL PORTSMOUTH	---	---	---	---	\$1,737,350 \$1,147,878	\$954 \$1,037	\$1,737,350 \$1,147,878	\$954 \$1,037	\$1,041 \$1,287	0.92 0.81
385 398	NMCL QUANTICO NMCL SEATTLE	---	---	---	---	\$2,451,057 \$1,067,577	\$389 \$1,722	\$2,451,057 \$1,067,577	\$389 \$1,722	\$310 \$2,013	1.26 0.86
528 701	NMCL SAN FRANCISCO NMCL SAN DIEGO	---	---	---	---	\$5,368,911 \$11,575,167	\$431 \$1,260	\$5,368,911 \$11,575,167	\$431 \$1,260	\$326 \$1,298	1.32 0.97
702 703	NMCL NORFOLK NMCL WASHINGTON DC	---	---	---	---	\$820,862 \$30,817	\$481 \$39	\$820,862 \$30,817	\$481 \$39	\$529 \$36	0.91 1.08
8031	NMCL LONDON	---	---	---	---	\$32,539,514	\$662	\$32,539,514	\$662	\$624	1.06
	NAVY CLINICS	---	---	---	---	\$493,229	\$292	\$493,229	\$292	\$312	0.93
203 248	USAF CLINIC EIELSON USAF CLINIC LOS ANGELES	---	---	---	---	\$683,141 \$1,759,882	\$798 \$691	\$683,141 \$1,759,882	\$798 \$691	\$680 \$982	1.17 0.70
249 250	USAF CLINIC MORTON USAF CLINIC MCCLELLAN	---	---	---	---	\$2,584,315 \$913,054	\$1,185 \$668	\$2,584,315 \$913,054	\$1,165 \$668	\$1,473 \$616	0.79 1.28
251 252	USAF CLINIC LOWRY USAF CLINIC PETERSON	---	---	---	---	\$10,073,013 \$1,723,571	\$3,777 \$647	\$10,073,013 \$1,723,571	\$3,777 \$647	\$1,403 \$815	2.69 0.79
287 293	15th MED GRP HICKAM 305th STRAT HOSP GRISCOM	---	---	---	---	\$1,088,121	\$697	\$1,088,121	\$697	\$925	0.75
310 328	USAF CLINIC HANSCOM USAF CLINIC MCGUIRE	---	---	---	---	\$792,351 \$791,280	\$684 \$625	\$792,351 \$791,280	\$684 \$625	\$949 \$637	0.72 0.98
335 338	USAF CLINIC POPE USAF CLINIC VANCE	---	---	---	---	\$631,869 \$530,911	\$425 \$715	\$631,869 \$530,911	\$425 \$715	\$472 \$785	0.90 0.91
356 363	USAF CLINIC CHARLESTON USAF CLINIC BROOKS	---	---	---	---	\$2,515,644 \$602,594	\$1,205 \$830	\$2,515,644 \$602,594	\$1,205 \$830	\$1,212 \$769	0.99 1.08
364 365	USAF CLINIC GOODFELLOW USAF CLINIC KELLY	---	---	---	---	\$1,437,393 \$1,313,896	\$1,045 \$948	\$1,437,393 \$1,313,896	\$1,045 \$948	\$1,108 \$1,069	0.94 0.89
366 395	USAF CLINIC RANDOLPH USAF CLINIC MCCHOARD	---	---	---	---	\$1,944,751 \$427,848	\$751 \$478	\$1,944,751 \$427,848	\$751 \$478	\$905 \$866	0.83 0.55
449 799	24th MED GRP HOWARD SAF CLINIC GEILENKIRCHEN	---	---	---	---	---	---	---	---	---	---
800 801	USAF CLINIC RHEIN MAIN USAF CLINIC SEMBACH	---	---	---	---	\$778,613 \$944,574	\$478 \$705	\$778,613 \$944,574	\$478 \$705	\$467 \$680	1.02 1.04
802 804	43rd STRAT CLINIC-ANDERSON 313th MED GRP KADENA AB	---	---	---	---	\$999,406 \$1,749,876	\$459 \$529	\$999,406 \$1,749,876	\$459 \$529	\$419 \$493	1.09 1.07

-- Continued --

EXHIBIT 6-13: DERIVATION OF FY88 CLINIC INPATIENT AND AMBULATORY O & M MODELED EXPENSES
(Concluded)

DMIS ID	FACILITY	MODELED NONCLINICIAN O&M EXPENSES	MODELED NONCLINICIAN O&M EXPENSES/WMU	MODELED CLINICIAN O&M EXPENSES	MODELED CLINICIAN O&M EXPENSES/WMU	MODELED AMBULATORY O&M EXPENSES	MODELED AMBULATORY O&M EXPENSES/WMU	MODELED INPATIENT AND AMBULATORY O&M EXPENSES	MODELED INPATIENT AND AMBULATORY O&M EXPENSES/WMU	OBSERVED 0807711 AND 0807792 O&M EXPENSES/WMU	RATIO OF MODELED TO OBSERVED
806	USAF CLINIC SPANGDAHLEM	---	---	---	---	\$940,723	\$694	\$940,723	\$694	\$421	1.65
806	USAF CLINIC RAMSTEIN	---	---	---	---	\$3,175,311	\$966	\$3,175,311	\$966	\$861	1.12
807	USAF CLINIC ZWEIBRUCKEN	---	---	---	---	\$801,669	\$543	\$801,669	\$543	\$543	1.00
808	USAF CLINIC AVIANO	---	---	---	---	\$683,449	\$716	\$683,449	\$716	\$721	0.99
808	USAF CLINIC SAN VITO	---	---	---	---	\$1,120,029	\$1,953	\$1,120,029	\$1,953	\$1,843	1.19
811	USAF CLINIC ZARAGOZA	---	---	---	---	\$780,209	\$1,503	\$780,209	\$1,503	\$993	1.51
812	USAF CLINIC BENTWATERS	---	---	---	---	\$655,420	\$385	\$655,420	\$385	\$411	0.94
813	USAF CLINIC CHICKSANDS	---	---	---	---	\$401,007	\$702	\$401,007	\$702	\$577	1.22
814	USAF CLINIC ALCONBURY-RAF UPR	---	---	---	---	\$754,996	\$558	\$754,996	\$558	\$564	0.99
815	USAF CLINIC FAIRFORD	---	---	---	---	\$546,991	\$1,101	\$546,991	\$1,101	\$917	1.20
824	USAF CLINIC ANKARA	---	---	---	---	\$826,182	\$2,340	\$826,182	\$2,340	\$2,086	1.12
825	USAF CLINIC IZMIR	---	---	---	---	\$445,304	\$1,081	\$445,304	\$1,081	\$1,244	0.87
827	USAF CLINIC CAMP NEW AMSTERD	---	---	---	---	\$500,863	\$899	\$500,863	\$899	\$668	1.35
1180	USAF CLINIC COMISO	---	---	---	---	\$894,871	\$1,793	\$894,871	\$1,793	\$1,051	1.71
1181	USAF CLINIC FLORENNES	---	---	---	---	\$341,802	\$1,026	\$341,802	\$1,026	\$927	1.11
1947	USAF CLINIC GREENHAM COMMON	---	---	---	---	\$419,097	\$613	\$419,097	\$613	\$584	1.05
	USAF CLINICS	---	---	---	---	\$48,055,036	\$877	\$48,055,036	\$877	\$768	1.11

RATIO OF MODELED TO OBSERVED O&M EXPENSES
FY88

SERVICE BRANCH/ FACILITY TYPE	MODELED 0807711/0807792 O&M EXPENSES	OBSERVED 0807711/0807792 O&M EXPENSES	RATIO OF MODELED TO OBSERVED
Army			
Medical Centers	\$ 339,045,722	\$ 344,222,700	0.98
CONUS Comm. Hosps.	\$ 370,125,987	\$ 363,946,600	1.02
Overseas Hospitals	\$ 164,233,609	\$ 158,474,400	1.04
Clinics	\$ 6,935,357	\$ 6,766,200	1.03
All Army Facilities	\$ 880,340,675	\$ 873,409,900	1.01
Navy			
Medical Centers	\$ 127,203,561	\$ 142,965,088	0.89
CONUS Comm. Hosps.	\$ 158,028,799	\$ 157,036,064	1.01
Overseas Hospitals	\$ 33,492,482	\$ 33,678,257	0.99
Clinics	\$ 32,539,514	\$ 30,686,964	1.06
All Navy Facilities	\$ 351,264,356	\$ 364,366,373	0.96
Air Force			
Medical Centers	\$ 207,034,532	\$ 213,568,898	0.97
CONUS Comm. Hosps.	\$ 292,094,618	\$ 290,852,645	1.00
Overseas Hospitals	\$ 37,577,200	\$ 36,528,377	1.03
Clinics	\$ 48,055,036	\$ 43,143,775	1.11
All USAF Facilities	\$ 584,761,386	\$ 584,093,695	1.00
DoD			
Medical Centers	\$ 673,283,815	\$ 700,756,686	0.96
CONUS Comm. Hosps.	\$ 820,249,403	\$ 811,835,309	1.01
Overseas Hospitals	\$ 235,303,291	\$ 228,681,034	1.03
Clinics	\$ 87,529,907	\$ 80,596,939	1.09
All DoD Facilities	\$1,816,366,416	\$1,821,869,968	1.00

The table illustrates that, overall, the predicted base year O&M expenses are nearly equal to those observed. This result highlights an important aspect of the O&M modeling in the context of resource allocation. Based upon these results, each Service would receive a nearly identical share of 0807711 and 0807792 O&M resources as historically observed. This feature permits, if desired, a "budget neutral" approach in the first year of implementation and helps minimize disruptions due to the introduction of a new system. The variation which is observed between observed and predicted O&M is essentially at the MTF level. Since the OASD(HA) budget review process is not concerned with MTF-level allocation, the deviations from model projection can be reviewed by each Service.

Exhibits 6-14 through 6-16 summarize the MTF level variation of the predicted results relative to observed O&M. The exhibits present the

EXHIBIT 6-14: SUMMARY OF FY88 ARMY 0307711/C897792 PREDICTED TO OBSERVED
RATIO

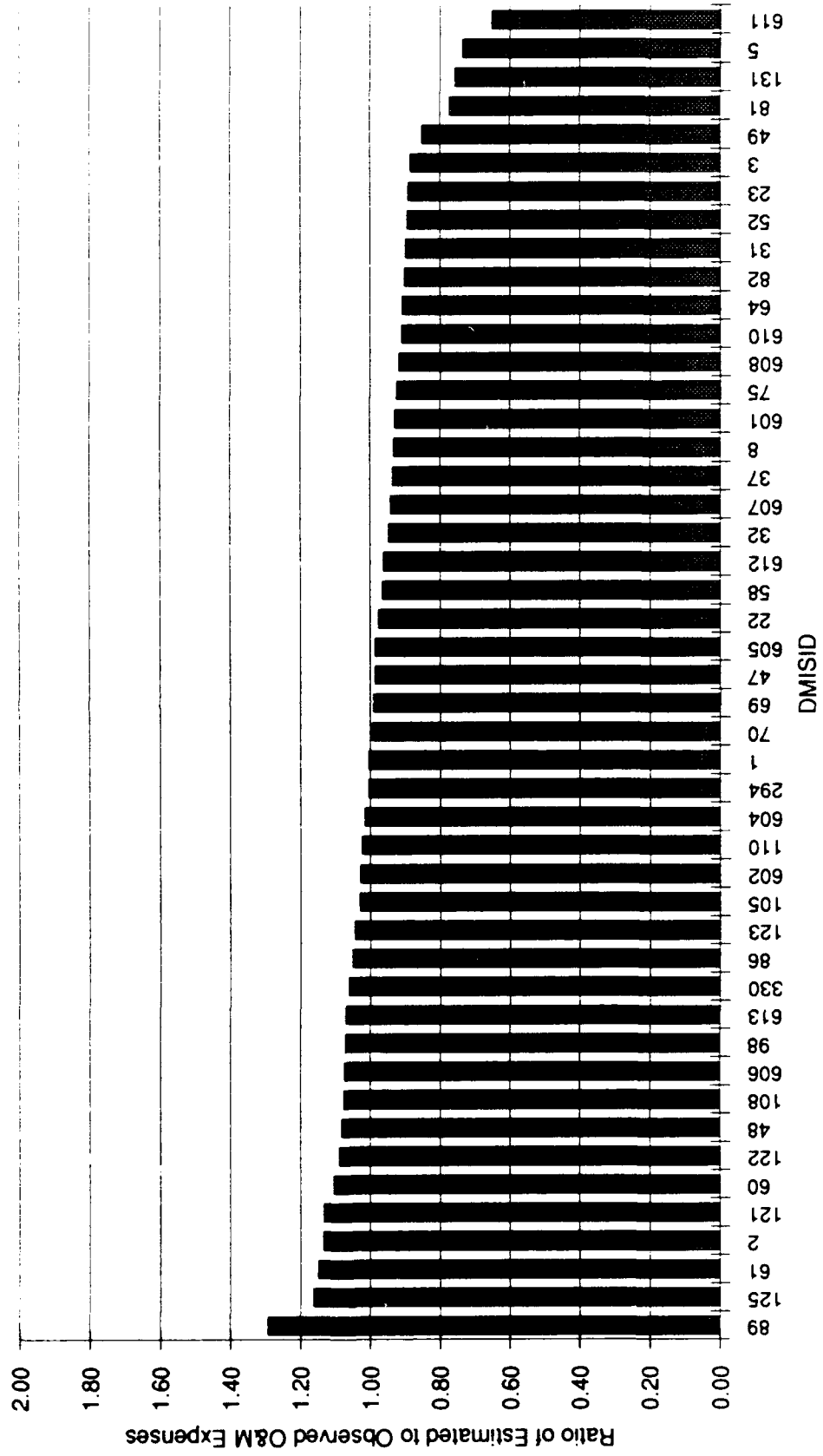


EXHIBIT 6-15: SUMMARY OF FY88 NAVY 0807711/080 '92 PREDICTED TO OBSERVED
RATIO

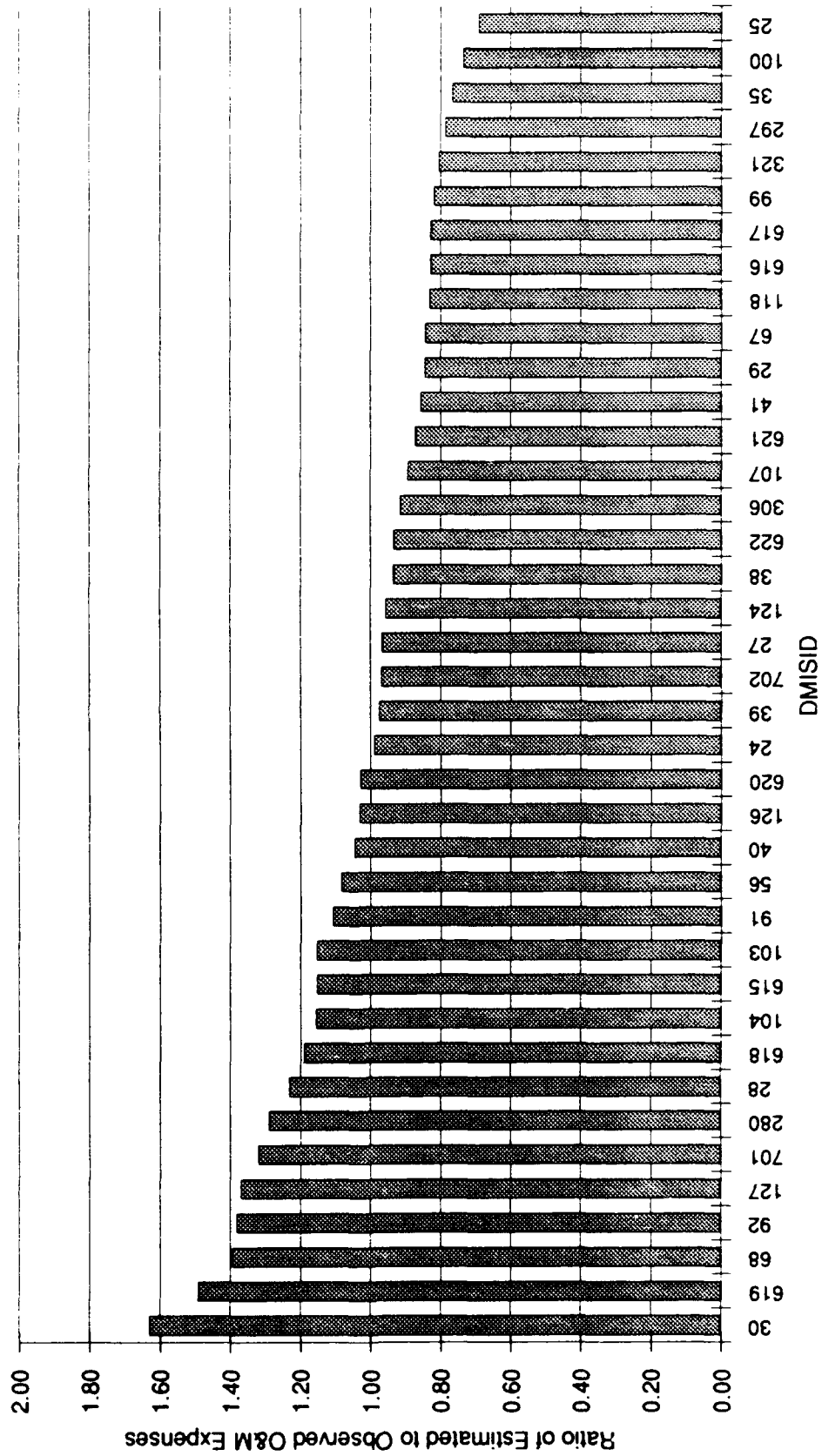
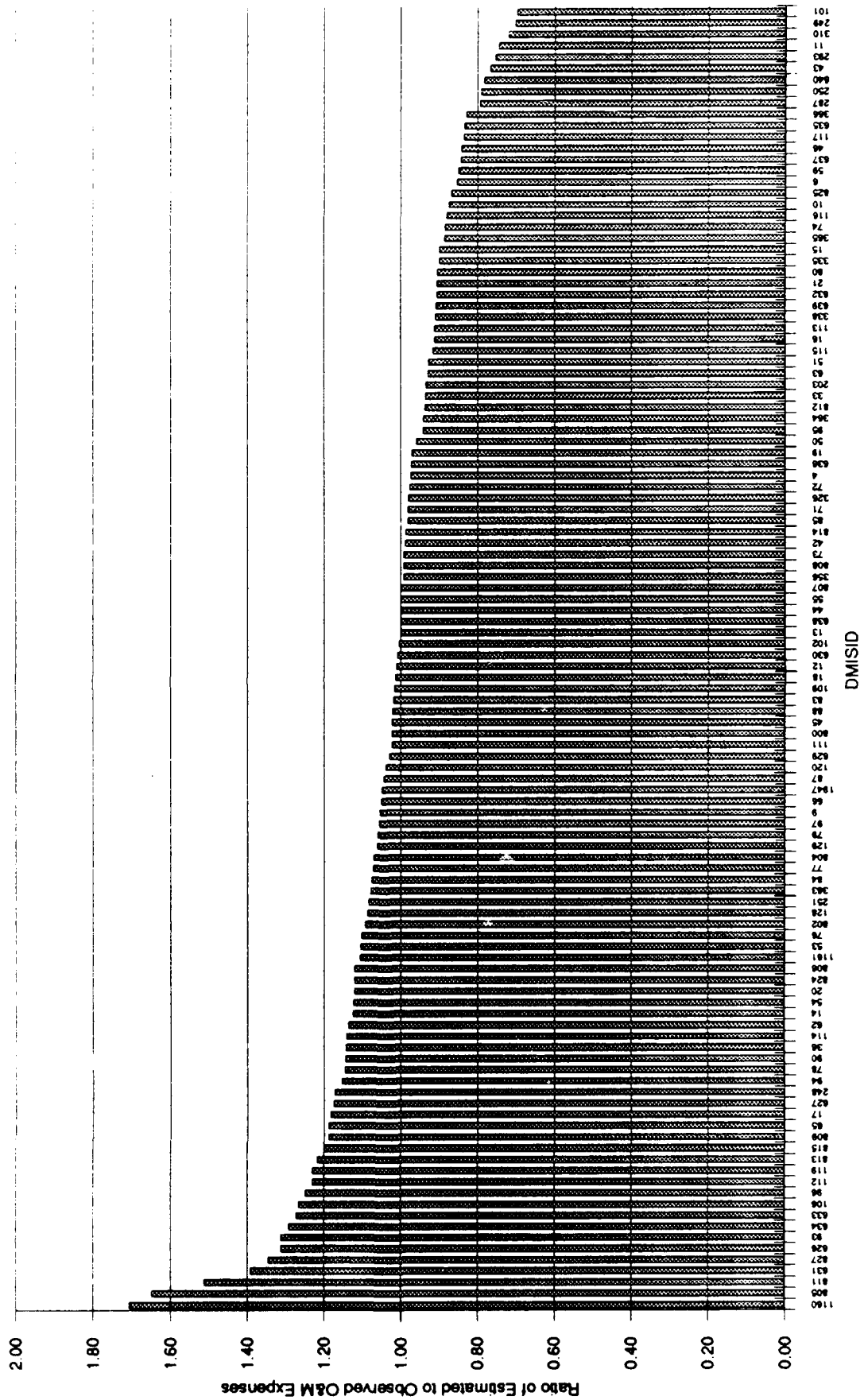


EXHIBIT 6-16: SUMMARY OF FY88 AIR FORCE 0807711/0807792 PREDICTED TO OBSERVED RATIO



ratio of predicted to observed O&M as presented in the final column of exhibits 6-10 through 6-13 for each MTF. The summary exhibits illustrate that MTF level variations between predicted and observed O&M may be considerable. This fact underscores the importance of a MTF-level O&M projection methodology, as implemented. It is recommended that the Services perform these reviews to ensure that MTF-unique requirements are properly reflected in final O&M budget requests.

If MTF-level circumstances dictate, the Services can impose budget neutrality at the MTF level by dividing the respective predicted O&M dollars from the model by the ratio of modeled to observed expenses. That is, the final column displayed in exhibits 6-10 through 6-13 which is labeled "Ratio of Modeled to Observed", is actually a MTF-level budget neutrality index.

6.3 FUTURE REFINEMENTS

Several enhancements have been identified that will provide improvements to the methodology documented in sections 6.1 and 6.2 of this chapter. It is anticipated that these enhancements will allow improved predictive accuracy at both the Service and MTF levels. The proposed enhancements fall into two broad categories:

- Expand the methodology to include O&M dollars in other PECs related to MTF operations.
- Enhance the methodology to reflect the impact of changes in MTF military/civilian staffing resources.

Details addressing these two areas of proposed enhancements are presented below. Section 6.3.1 provides aspects of enhancements which address the inclusion of additional O&M resources. Section 6.3.2 presents an approach which is reflective of changes in military staffing resources and can also be designed to address additional O&M resources.

6.3.1 EXPAND THE SCOPE OF PROJECTED O&M REQUIREMENTS

The methodology described in previous sections focuses on the program elements that represent the majority of DoD healthcare O&M. Although the methodology addresses a significant portion of all MTF resources, additional refinement is possible through the inclusion of other program elements. The current means of converting MEPRS expenses into O&M dollars is accomplished through the O&M multiplier described in section 6.1, which relates O&M expenses in the numerator to MEPRS expenses in the denominator. As currently defined, the numerator consists of O&M expenses for program elements 0807711 and 0807792 while the denominator is defined as MEPRS inpatient and ambulatory expenses. As noted previously, not all 0807711/0807792 expense is tracked in the inpatient or ambulatory MEPRS accounts. Thus, the methodology can be improved by including MEPRS expenses from all areas which include 0807711/0807792 expenses. Further, it is anticipated that the current definition of the O&M multiplier can be enhanced to include other areas of O&M expense. As other program elements are included in the methodology, the approach draws closer to projecting total O&M requirements for each Service. Ultimately, all O&M elements of expense that are related to MTF operations could be included. Similarly, workload measures which relate to those additional expenses would also be added to the methodology. Thus, an expansion of the current methodology would provide a more complete linkage between MTF workload and O&M resource requirements.

The expansion of the current methodology to address other aspects of O&M can be thought of in two parts -- one relating to the definition of the O&M multiplier numerator and the other relating to the denominator. With respect to the numerator, the approach can be enhanced by identifying other O&M costs to be included in the resource requirement estimation process. The second part of this enhancement relates to

expanding the scope of MEPRS expenses included in the denominator to which O&M requirements are linked. These two aspects of the enhanced approach are discussed below.

Other O&M Program Elements

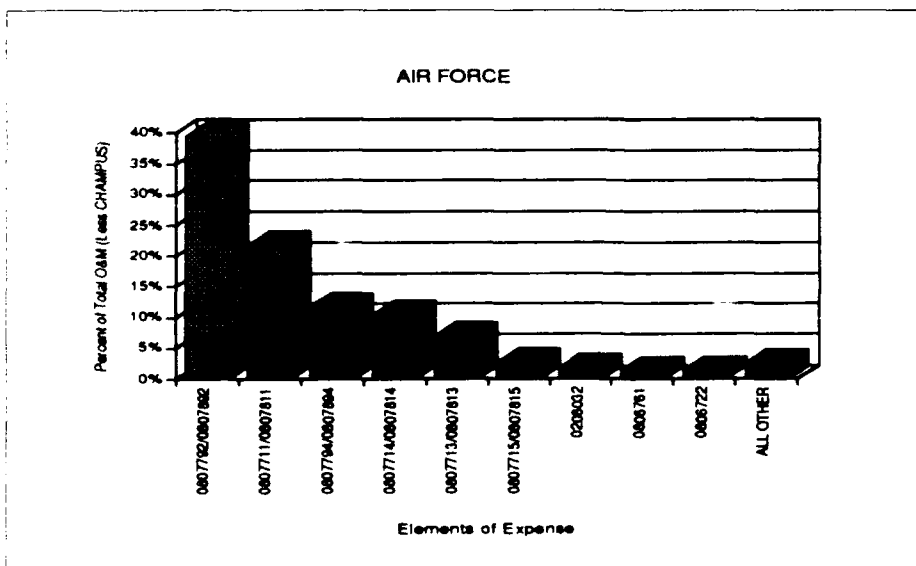
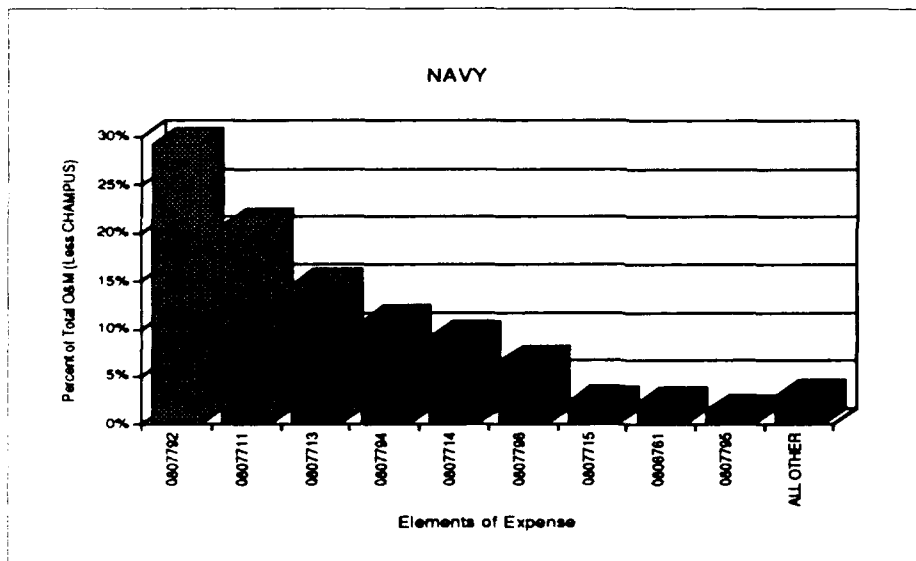
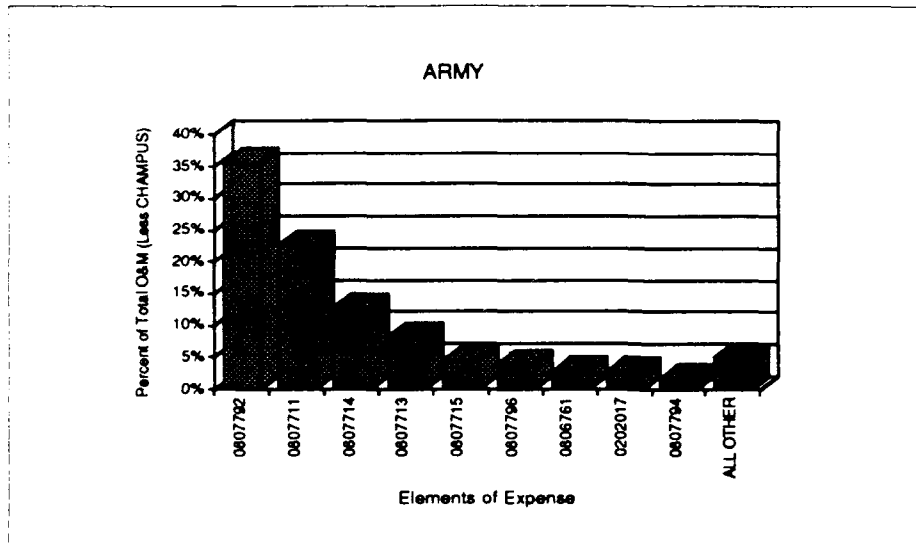
Although program elements 0807711 and 0807792 represent a considerable portion of total MTF O&M requirements, several other elements of expense exist that are linked to MTF operations and thus, should be considered for inclusion in the methodology. Exhibit 6-17 illustrates the distribution of FY90 Army, Navy and Air Force expenses by program element. The exhibit demonstrates that several program elements, such as 0807714 (Other Health Activities), 0807794 (Real Property Maintenance), 0807796 (Base Operations) and 0807715 (Dental), stand out as candidates for inclusion in the methodology. Adding these four areas of expense would increase the resources addressed by the methodology to over 80 percent of all O&M.

In a similar manner, other program elements that are related to MTF operations could also be included. Ideally, the enhanced methodology would address all O&M elements of expense related to MTF operations in order to provide projections which reflect total MTF O&M requirements. Prior to including additional program elements, further study would be required to identify those areas of expense that are most appropriate for inclusion, especially in light of Service budgeting and accounting differences.

Other Projected MEPRS Expenses

As additional program elements of O&M expense are included in the methodology, it is important to properly relate those expenses to the expenses tracked in MEPRS. This linkage is essential in order to

EXHIBIT 6-17: DISTRIBUTION OF FY90 O&M EXPENSES BY PROGRAM ELEMENT

**LEGEND**

0807792/0807814	Station Hops/Clinics
0807711/0807811	Care in Reg Del Facilities
0807714/0807814	Other Health Activities
0807713/0807813	Care in non Del Facilities
0807794/0807894	Real Property Maintenance
0807796	Base Operations - Med
0807715/0807815	Dental Care
0806761/0806861	Education & Training
0806722	Armed Forces Hlth ProfSchlr Pgm
0202017	Tac Sup - Med Units

translate projected workload into O&M expenses using MEPRS-based cost models. As elements of expense are added to the methodology, it is essential that the MEPRS basis for the expense projections be enhanced to include all workcenters which are closely related to the O&M resources being allocated. For example, if PEC 0807715 is included in the methodology, it is most appropriate to include the Dental functional area ("C" accounts) from the MEPRS systems when computing ratios of O&M to MEPRS expenses. Similarly, expenses from Special Programs accounts should be included in the denominator of the O&M multiplier as PECs such as 0807714 (Other Health Activities) are to be projected.

The inclusion of additional areas of MEPRS expense in the methodology raises an issue relating to MEPRS-based cost models. As each additional area of MEPRS expense is included in the methodology, a corresponding approach is required that will project MEPRS expenses based upon some relevant unit of workload. That is, a means of projecting MEPRS expense based upon prospective workloads must be devised for each additional area. In the case of the Dental functional area, this can be accomplished through MEPRS cost models that relate observed Dental expenses to dental workload.¹

However, some areas of MEPRS expense are not as readily linked to workload under the EAS II system, with Special Programs workcenters ("F" Accounts) being a good example. Under current MEPRS reporting requirements, many Special Programs workcenters do not track a workload measure to which expenses are linked, thereby limiting the possibilities for modeling these expenses. One method for projecting Special Programs expenses is to simply "pass-through" these expenses. This approach entails using historical Special Programs expenses which have been adjusted to reflect inflation and any expected programmatic changes. The

¹It is feasible to model MEPRS dental expenses in terms of either dental procedures or dental AWUs.

disadvantage of this approach is that it is not directly linked to a unit of output and may not accurately reflect changes in MTF resource requirements. The advantages are that it is straightforward to implement and can be integrated in the current methodology without additional modeling efforts.

An alternate approach is based upon the use of underlying MEPRS data that track performance factors for each of the Special Program accounts. One approach revolves around data that are available in what are known as MEPRS PIND (Permanent Input Dataset) files. These files contain the detailed underlying information used by the EAS II system to perform the step down and purification of MEPRS expenses into final operating accounts. One of the components of the PIND information is the Stepdown Assignment Statistics (SAS) files, which track the performance measures used by the EAS program to step down expenses. As such, the SAS files provide insight into MTF performance measures not reported through the standard MEPRS data transmissions. SAS performance measures are tracked for all intermediate (ancillary support) workcenters, including workcenters that do not report performance measures outside of the EAS system (i.e., they are not reported through MEPRS). For example, several special program accounts, such as Support to CHAMPUS Beneficiaries (FCC), do not report a performance measure in the MEPRS data sets and thus modeling expenses as a function of workload is not feasible. In contrast, the performance measures obtained from EAS SAS files provides the workload data necessary to accomplish this task. As a result, it is recommended that future studies consider the development of cost models based upon SAS-derived workloads as a means of enhancing the scope and accuracy of the current methodology. It is further recommended that these enhancements be studied in terms of the information

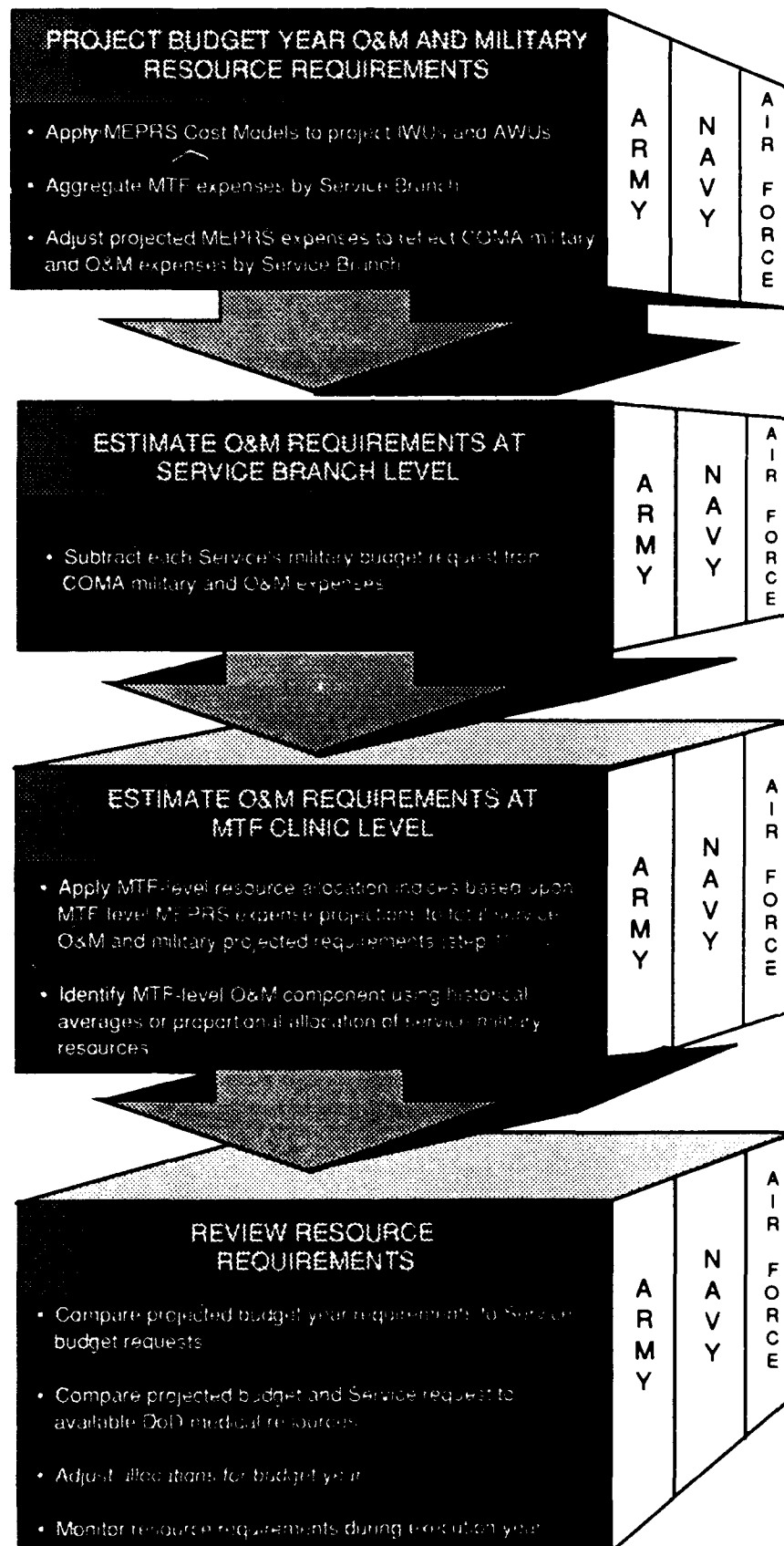
currently available through EAS II and that which is anticipated through EAS III.

6.3.2 IMPROVED SENSITIVITY TO CHANGES IN CIVILIAN/MILITARY STAFFING

The current approach to estimating O&M is based upon a point estimate of O&M expenses as a percentage of MEPRS expenses. As complete financial data for additional years become available from the Services, it is recommended that the O&M multiplier approach detailed in the previous sections be analyzed to assess its stability and predictive accuracy over time. This is best accomplished through analysis of multiple year datasets which provide MTF-level financial data by program element, object class and workcenter. MTF-level O&M multipliers would be developed for each year, using financial data and the respective MEPRS expenses. If considerable year-to-year variation is observed, it is recommended that enhancements to the methodology which incorporate military resource availability be adopted.

An approach that address changes in military resources has been developed which is a relatively straightforward extension of the methodology presented throughout this document. This approach includes aspects of both enhancement categories presented above. That is, it offers a means of expanding the O&M resources included in the methodology and addresses potential shifts in military resource availability. An overview of the proposed enhanced approach is presented in exhibit 6-18. The approach builds directly upon the currently methodology, providing additional linkage to military resource availability and direct comparability to the OASD(HA) Report on the Cost of Medical Activities (COMA). The four steps summarized in the exhibit are discussed below with an emphasis on the relationship to the current methodologies and the respective improvements offered.

EXHIBIT 6-18: SUMMARY OF ENHANCED RESOURCE ALLOCATION METHODOLOGY



Step 1: Project Budget Year O&M and Military Requirements

This step of this methodology remains largely the same as under the current methodology. As is currently the case, IWUs and AWUs projected to the budget year under review are input to the MEPRS cost models to project total expense. As noted in section 6.3.1, the MEPRS expenses currently modeled could potentially be expanded to include other functional areas (i.e., Dental and Special Programs), to more fully address MTF operational expenses. If additional areas of expense are to be projected, the respective workload inputs for those areas must also be projected to the budget year under review. Projected expenses for each MTF are aggregated by Service Branch and adjusted for consistency with the COMA. This adjustment is accomplished through Service-unique adjustment indices that reflect the relationship between MEPRS total expenses and those expense tracked in the COMA which are most closely related to MTF operations. The benefits of this adjustment are twofold: projected expenses are converted from MEPRS to budget/financial terms; and at the same time, benchmarked to the COMA. This provides comparability within the OASD(HA) budget review process.

Step 2: Estimate Service Branch O&M Requirements

The projected expenses from the previous step are adjusted to incorporate each of the Service's military personnel budget requests. The total military personnel requirement for program areas related to MTF operations are subtracted from the total O&M and military personnel projections. The result is a projected O&M requirement for each Service which has been defined, based upon case-mix adjusted workloads (from the MEPRS cost models) and available military personnel resources. The output of this step provides the basis for review of Service O&M budget requests.

Step 3: Estimate MTF/Clinic O&M Requirements

The O&M and military personnel resources for each Service's MTFs can be projected based upon an MTF-level resource allocation index (RAI). This index is computed for each MTF based upon projected MTF MEPRS expenses relative to total Service projected MEPRS expenses. Each MTF's RAI is applied to the respective Service total projected resources (from step 1) to produce MTF-level estimates of O&M and military resources. Each MTF's O&M share is computed, based upon the historical share of O&M expenses relative to total expenses observed at each MTF. As an alternative, O&M resources can be defined at the MTF level based upon a proportionately allocating the Service military personnel based upon each MTF's RAI. Using this alternative, the resultant MTF-level military personnel estimate is subtracted from the MTF's total O&M and military personnel which was similarly allocated.

Step 4: Review Resource Requirements

As with the current methodology, the resultant resource projections require review and adjustment, particularly to reflect MTF-unique requirements. Four areas of review have been identified:

- (1) compare projected resources to Service budget requests;
- (2) compare projected resources to DoD medical budget ceilings;
- (3) adjust Service branch allocations; and
- (4) monitor Service resource utilization.

The projected O&M requirements for each Service developed in the second step of the enhanced methodology can be directly compared to the Service's O&M budget request. This is accomplished by augmenting the projected O&M, which focuses on program elements linked to MTF operations, to also include non-MTF O&M requirements. Combining the projected MTF O&M with the non-MTF O&M portion of expense provides an

aggregate projected Service Branch O&M requirement. This requirement can be compared directly with the Service budget request for O&M resources.

The projected total O&M resources for each Service can also be aggregated and compared to DoD medical budget ceilings. Clearly, it is possible that the projected total O&M requirements may exceed the budget ceilings established for DoD healthcare. This is particularly true during budget review cycles which follow reductions to the President's Budget. Subsequent reductions to DoD medical appropriations may dictate that the available resources, albeit less than those required, can be allocated to the Services based upon the resource allocation indices developed in the third step of the enhanced methodology.

As the budget execution year progresses, it is necessary to monitor the observed resource utilization by the Services, to ensure that projected resources are properly gauged to meet the actual resource needs. The monitoring of resources has two parts. First, check that expected MEPRS expenses based upon case-mix adjusted workload are using data from the budget execution period being reviewed (e.g., fiscal quarter). These projected expenses are computed in a manner identical to that described above, substituting annualized observed budget execution year workloads for projected workloads in the methodology.¹ The resultant expenses reflect the MTF-level expected MEPRS expenses, adjusted for case-mix complexity. These expected expenses can be compared to observed expenses to identify MTFs with potential surpluses or shortfalls. Second, these discrepancies may be in part due to unexpected workload levels, changes in staffing patterns, or other unexpected workload fluctuations.

¹Quarterly observed workloads must be annualized in order to maintain consistency with the MEPRS costs models, which project annual expenses.

